SERVICE DATA
FILE NO. 034 - 276
SUPPLEMENT-B

TOSHIBA

COLOR VIDEO CASSETTE RECORDER

V-161F/V-261F

This Service Data covers only different parts from Service Data (File No. 030-276) for Model V-159F/V-259F.
The technical information included in the Service Data (File No. 030-276) for V-159F/V-259F can be used for V-161F/V-261F servicing since V-161F/V-261F is basically the same as Model V-159F/V-259F. tv08853

Different Parts

Location No.	Description	Part No. V-161F	Reference No. (V-159F)
A101	Front Panel	70884159	70884056
A101F	Door	70868303	——
A101H	Door	——	70868246
A101P	Door Spring	70866631	——
A103A	Cassette Door	70868302	70868238
A103B	Spring	70351857	70351848
A104	Top cover	70824310	70824307
A111	Insulator	70869102	——
A121	Insulator	70843464	——
A121C	Screw	70391440	——
A701	Case	70917590	70917454
A702	Packing (U)	70921400	70921350
A703	Packing (B)	70921401	70921351
Y101	Owners Manual	70971353	70971221

Different Parts

Location No.	Description	Part No. V-261F	Reference No. (V-259F)
A101	Front Panel	70884160	70884049
A101F	Door	70868305	70868236
A103A	Cassette Door	70868302	70868234
A104	Top Cover	70824310	70824307
A111	Insulator	70869102	———
A121	Insulator	70843464	———
A121C	Screw	70391440	———
A701	Case	70917591	70917435
A702	Packing (U)	70921400	70921350
A703	Packing (B)	70921401	70921351
Y101	Owners Manual	70971352	70971201

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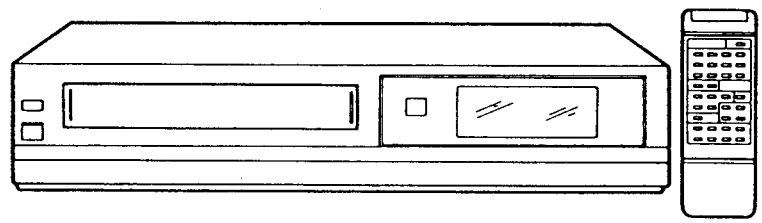
TOSHIBA

COLOR VIDEO CASSETTE RECORDER

V-109F/159F/209F/259F/269F/490F



(V-259F)

SPECIFICATIONS

GENERAL

Video recording system:	Head configuration 2-head rotary
Video signal:	CCIR standard, SECAM color (V-109F/209F/490F) CCIR standard, PAL/SECAM color (V-159F/259F/269F)
Storage temperature:	-20^{o} to $+60^{o}$C (-4^{o} to $+140^{o}$F)
Operating temperature:	5^{o} to 40^{o}C (41^{o} to 104^{o}F)
Antenna:	75-ohms external aerial terminal for VHF and UHF

Channel coverage:
(V-109F/209F/490F)

BAND	SYSTEM
V_L: Lower VHF band	FB – FC
V_H: Higher VHF band	F1 – F6
UHF band	E21 – E69
CATV	B – Q (12 MHz), 70 – 86 (10.5 MHz)

(V-159F/259F/269F)

SYSTEM / BAND	SECAM	PAL
V_L: Lower VHF band	FB – FC	E2 – E4
V_H: Higher VHF band	F1 – F6	E5 – E12
UHF band	E21 – E69	E21 – E69
CATV	B – Q (12 MHz) 70 – 86 (10.5 MHz)	——

a total of up to 49 preselected channels

AERIAL output signal:	UHF channel 31 to 39 (variable)
Power requirements:	AC 220V, 50 Hz
Power consumption:	29W
Weight:	6.4 kg
Dimensions:	430 x 88 x 353mm (W/H/D)

VIDEO

Input:	VIDEO LINE IN: 21 pin Euro-connector, 1.0V (p-p), 75-ohms, unbalanced, sync negative
Output:	VIDEO LINE OUT: 21 pin Euro-connector, 1.0V (p-p), 75-ohms, unbalanced, sync negative
Signal-to-noise ratio:	Better than 43 dB

AUDIO

Input:	AUDIO LINE IN: 21 pin Euro-connector, more than 10 k-ohms, –5 dBs
Output:	AUDIO LINE OUT: 21 pin Euro-connector, less than 1 k-ohms, –5 dBs
Frequency response:	80 to 10 kHz
Signal-to-noise ratio:	Better than 42 dB

TAPE TRANSPORT

Tape speed:	23.39 mm/sec.
Maximum recording-time:	4 hours (with E-240)
Fast forward time:	Within 6 min. (E-180)
Rewind time:	Within 6 min. (E-180)

TIMER

Fluorescent digital display
Count down from AC-line frequency.

Caution: Copyright Act 1956 Users of video recording equipment should note that it may be unlawful to record television broadcasts, cinematograph films or video recording without the permission of the relevant copyright owner.

Design and specifications are subject to change without notice.

PRINTED IN JAPAN Sep., 1989 (S)

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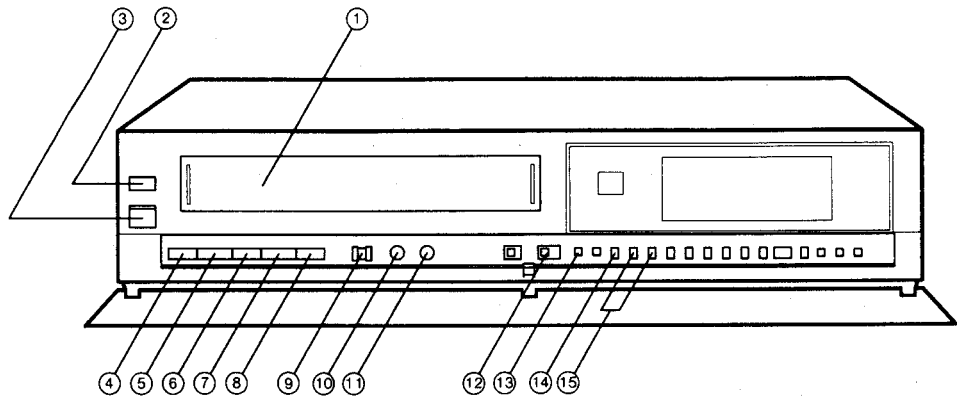
SECTION 1
GENERAL DESCRIPTION

OPERATING INSTRUCTIONS (V-159F/259F/269F)

PANNEAU AVANT



PANNEAU AVANT

① **Logement de cassette**
Glisser la cassette dans l'appareil jusqu'à ce que le mécanisme l'insère automatiquement.

② **Touche d'éjection (EJECT.)**
Appuyer sur cette touche pour retirer la cassette pendant que l'appareil est encore sous tension.

③ **Touche de mise sous tension/mise en attente (MARCHE)**
Cette touche est utilisée pour mettre le magnétoscope sous et hors tension.

④ **Touche de rebobinage (RET. RAP.)**
Appuyer sur cette touche pour rebobiner la bande. Pendant le mode de lecture, appuyer sur cette touche pour reproduire la bande en marche arrière.

⑤ **Touche de lecture (LECTURE)**
Appuyer sur cette touche pour reproduire une bande pré-enregistrée. Le témoin LECT. s'allume. Il est possible de faire avancer les images une par une si le magnétoscope se trouve en mode d'image fixe.

⑥ **Touche d'avance rapide (AV. RAP.)**
Appuyer sur cette touche pour faire avancer rapidement la bande. En mode de lecture, appuyer sur cette touche pour reproduire les bandes en accéléré.

⑦ **Touche d'arrêt (ARRET)**
Appuyer sur cette touche pour arrêter le défilement de la bande ou pour interrompre la fonction d'exploitation automatique.

⑧ **Touche d'arrêt momentané (PAUSE/AR. IMAGE)**
Utilisée pour faire fonctionner le magnétoscope de trois manières:
A) Pour arrêter momentanément la bande en mode d'enregistrement.
B) Pour visionner une image fixe en mode de lecture.
C) Pour faire avancer les images une par une, en appuyant sur la touche LECTURE, après avoir enclenché cette touche.

⑨ **Touche d'enregistrement (ENR.)**
Appuyer sur cette touche pour lancer l'enregistrement. Le témoin ENR. s'allume.

⑩ **Réglage d'alignement (ALIGNEMENT)**
Utiliser ce réglage au cours de la lecture, pour ajuster l'image et éliminer les bruits éventuels.

⑪ **Réglage de l'image (IMAGE)**
Pour rendre l'image plus nette, tourner ce réglage dans le sens des aiguilles d'une montre et pour rendre l'image plus douce, le tourner dans le sens contraire.

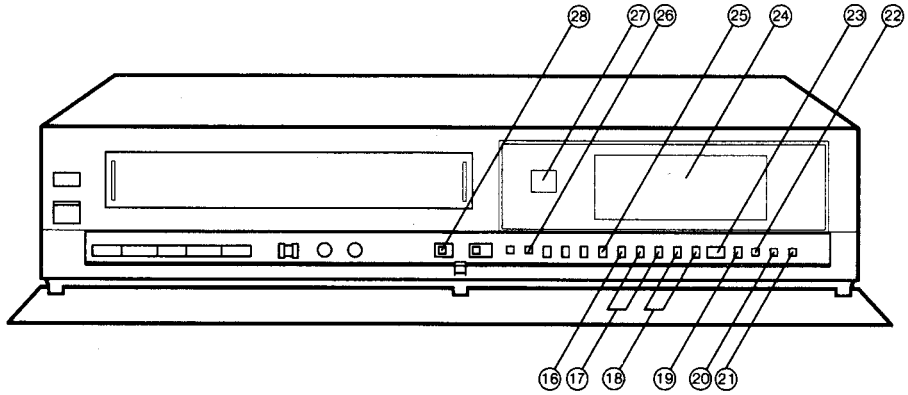
⑫ **Interrupteur de système (SYSTEM; AUTO/PAL /SECAM)**
Pour l'utilisation de cet interrupteur.

⑬ **Touche de préréglage (PREREGLAGE)**
Utilisée pour prérégler les chaînes.

⑭ **Touche de programmation (PROG.)**
Utilisée pour lancer le fonctionnement programmé par minuterie.

⑮ **Touches de sélection de chaîne (incrémentation et décrémentation) (PROG. TV)**
Utilisées pour choisir une chaîne spécifique que l'on souhaite regarder ou enregistrer.
Touche de décrémentation (∨): Lorsque cette touche est enfoncée une seule fois, le chiffre des chaînes diminue d'une unité à la fois.
Touche d'incrémentation (∧): Lorsque cette touche est enfoncée une seule fois, le chiffre des chaînes augmente d'une unité à la fois.

PANNEAU AVANT



⑯ **Touche d'enregistrement immédiat par minuterie (ENR. IMMEDIAT) et touche NORMES**
Touche ENR.IMMEDIAT: Utilisée pour procéder à un enregistrement, par tranches de 30 minutes, en mode normal (4 heures maximum).
Touche NORMES: Utilisée pour changer la plage de fréquence de SECAM ou PAL lorsque la touche PREREGLAGE est appuyée. (Voir 12 et 32)

⑰ **Touches de recherche (RECHERCHE +/−) et touches de réglage (SET +/−)**
Touche RECHERCHE (−): Cette touche est utilisée pour le préréglage des chaînes. Par poussée sur cette touche, la syntonisation des chaînes descend vers les chaînes inférieures.
Touche SET (−): Cette touche est utilisée pour les réglages de la date, de l'horloge et de la programmation par minuterie. Par poussée sur cette touche, les chiffres décroissent.
Touche RECHERCHE (+): Cette touche est utilisée pour le préréglage des chaînes. Par poussée sur cette touche, la syntonisation des chaînes monte vers les chaînes supérieures.
Touche SET (+): Cette touche est utilisée pour les réglages de la date, de l'horloge et de la programmation par minuterie. Par poussée sur cette touche, les chiffres croissent.

⑱ **Touches d'accord fin (FIN +/−) et touches d'étape (SHIFT +/−)**
Touches FIN (+/−): Utilisées pour le préréglage des chaînes. Lorsqu'on souhaite accéder à une chaîne inférieure, utiliser la touche FIN (−) pour procéder à un accord fin. Utiliser la touche FIN (+) lorsqu'on souhaite accéder à une chaîne supérieure, afin d'obtenir la meilleure réception possible.
Touches SHIFT (+/−): Ces touches sont utilisées pour les réglages de la date, de l'horloge et de la programmation par minuterie. Utiliser la touche SHIFT (+) pour modifier la position du réglage du poste suivante. Utiliser la touche SHIFT (−) pour modifier la position du réglage du poste précédente.

⑲ **Touche de téléviseur/magnétoscope (TV/VIDEO)**
Commute le téléviseur ou le magnétoscope.

⑳ **Touche de retour à zéro (RETOUR ZERO)**
Utilisée pour rebobiner ou faire avancer rapidement la bande aux alentours de la position "0H00M00S", posée à l'aide de la touche COMPT. ZERO.

㉑ **Touche de réinitialisation (COMPT. ZERO)**
Utilisée pour faire revenir le relevé du compteur ou le relevé du compteur de bande restante sur "0H00M00S".

㉒ **Touche d'annulation (ANNUL.)**
Utilisée pour effacer les données préréglées pour les séquences de programmation de 1 à 8. Choisir la séquence de programmation dont on souhaite effacer les données, par la touche PROG., puis appuyer sur la touche ANNUL.

㉓ **Touche de minuterie (AUTO.)**
Utilisée pour entrer en mode de minuterie. Pour libérer le mode de mise en attente par minuterie, appuyer de nouveau sur cette touche.

㉔ **Affichage fluorescent**

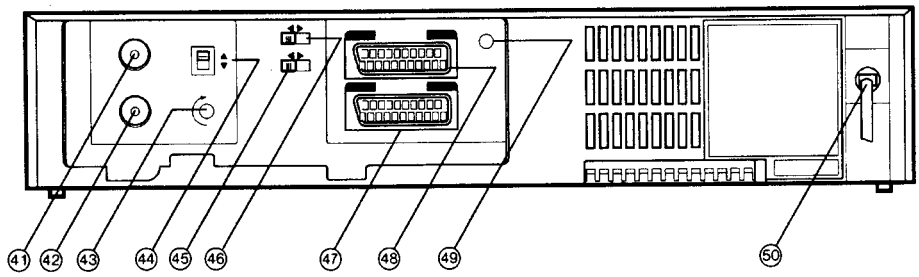
㉕ **Touche de saut (FRANCHIR) et touche de vérification des programmations mémorisées (CONFIRM.)**
Utilisée pour sauter des chaînes dans le préréglage des chaînes. Utilisée également pour vérifier les données de programmation entrées. Lorsque cette touche est enfoncée, le balayage de la programmation commence et fait apparaître de manière continue le contenu de la programmation sur l'affichage fluorescent.

㉖ **Touche de mise à l'heure de l'horloge (HORL. REGLAGE)**
Utilisée pour régler ou réajuster l'heure et la date du magnétoscope. Lorsque cette touche est enfoncée une seule fois, l'appareil entre en mode de réglage de l'horloge. Si la touche est enfoncée une nouvelle fois, après avoir mis l'horloge du magnétoscope à l'heure, celle-ci se met immédiatement à fonctionner.

㉗ **Récepteur du rayon infrarouge de la télécommande**
Ce récepteur capte les signaux infrarouges envoyés par la télécommande.

㉘ **Sélecteur de bande (TAPE)**
Placer sur la position E-180, lorsqu'on utilise des cassettes dont la durée est inférieure aux cassettes E-180.
Placer sur la position E-240, lorsqu'on utilise des cassettes E-240.

PANNEAU ARRIERE



41 **Douille d'entrée d'antenne (ANTENNE ENTREE)**
Brancher le fil d'antenne à cette borne.

42 **Fiche de sortie d'antenne (SORTIE RF)**
Relier cette sortie à l'entrée antenne du téléviseur.

43 **Réglage du canal UHF (CANAL)**
La sortie en provenance du magnétoscope vers le téléviseur peut être réglée sur tout canal entre 31 et 39, en s'aidant d'un petit tournevis.

44 **Interrupteur du signal d'essai (SIGNAL TEST)**
Délivre un signal d'essai pour aider l'utilisateur à accorder le téléviseur sur la sortie du magnétos cope.

45 **Interrupteur de système du téléviseur**
Pour l'utilisation de cet interrupteur.

46 **Sélecteur de mode vidéo (COUL./N/B)**
Pour l'enregistrement et la lecture.
COUL: Le placer sur cette position quand le signal d'entrée ou de lecture vidéo est en couleur.
N/B: Le placer sur cette position quand le signal d'entrée ou de lecture vidéo est monochrome.

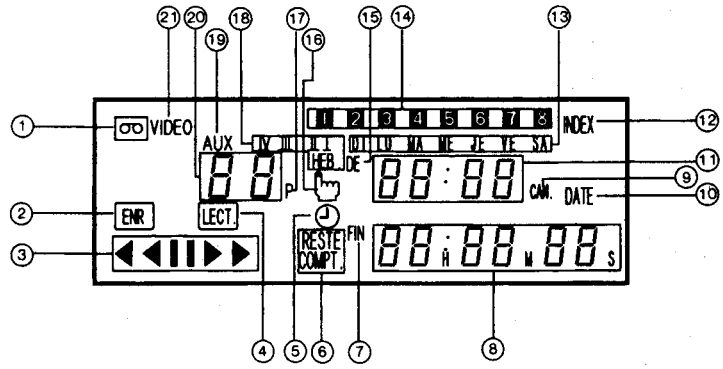
47 **Connecteur CANAL PLUS décodeur (C.+ DECODEUR)**
Connecter le décodeur PERITEL 21 broches.

48 **Connecteur audio/vidéo (AUDIO/VIDEO)**
Cet euro-connecteur à 21 broches est utilisé pour recevoir les signaux audio et vidéo en provenance d'une source externe, munie du même type de connecteur.

49 **Réglage de verrouillage vertical (STABILITE VERTICALE)**
Ajuster ce réglage sur la position minimum lorsque l'image défile verticalement, en mode d'image fixe.

50 **Cordon d'alimentation**
Le brancher à une prise secteur (220V, 50 Hz).

TEMOINS



TEMOINS

① **Témoin de présence de cassette**
Ce témoin s'allume lorsqu'une cassette est en place, même si le magnétoscope est hors tension. Il clignote lorsque la bande est insérée ou éjectée.

② **Témoin d'enregistrement (ENR)**
Il s'allume lorsque l'appareil est en mode d'enregistrement ou en mode de pause à l'enregistrement.

③ **Témoins multi-fonctions**
Voir la table ci-dessous

Table de témoins

Lecture LECT. ▶	Image fixe LECT. II	Enregistrement ENR ▶	Rebobinage ◀◀	Avance rapide ▶▶
Avance image par image LECT. II ▶	Ralenti LECT. I ▶	Recherche image arrière LECT. ◀◀	Recherche image avant LECT. ▶▶	Pause ENR. II

④ **Témoin de lecture (LECT.)**
Il s'allume lorsque l'appareil se trouve en mode de lecture, de lecture d'image fixe, de lecture au ralenti, de lecture image par image, de recherche d'image en marche avant et en marche arrière.

⑤ **Témoin de minuterie**
Il s'allume lorsque la touche AUTO. est enfoncée.

⑥ **Témoin de bande restante/compteur (RESTE-/COMPT.)**
Indique le mode dans lequel l'appareil se trouve lorsque la touche RESTE/COMPT. est enfoncée.

⑦ **Témoin du moment de mise à l'arrêt de la minuterie**
Il s'allume au cours du réglage du moment de mise à l'arrêt de la minuterie.

⑧ Il indique la date courante, le moment de la mise à l'arrêt de la programmation par minuterie, le relevé du compteur, ainsi que la durée encore disponible sur la bande.

⑨ **Témoin de chaîne**
Il s'allume lorsqu'un signal est reçu par le démodulateur du magnétoscope. Il indique la chaîne en cours de visionnage ou d'enregistrement.

⑩ **Témoin de la date (DATE)**
Il s'allume pendant le réglage de la date.

⑪ Il indique l'heure de l'horloge du magnétoscope, le moment de mise en marche de la programmation par minuterie et l'affichage du réglage de la chaîne.

⑫ **Témoin d'indexation (INDEX)**
Il s'allume lorsque la touche INDEX est enfoncée.

⑬ **Témoin du jour**
Indique le jour courant et le jour où la programmation par minuterie doit commencer.

⑭ **Témoins du numéro de programme**
Ces témoins indiquent le numéro de programme dans laquelle des réglages ont été entrés, lors du réglage de la programmation par minuterie.

⑮ **Témoin du moment de mise en marche de la programmation par minuterie**
Il s'allume pendant le réglage du moment de mise en marche de la programmation par minuterie.

⑯ **Témoin d'enregistrement déclenché par minuterie et une seule touche (ENR. IMMEDIAT)**
Il s'allume pendant l'enregistrement déclenché par minuterie et une seule touche.

⑰ **Témoin de la position de chaîne**
Il s'allume lors de la sélection des positions de chaîne, au cours du préréglage des chaînes.

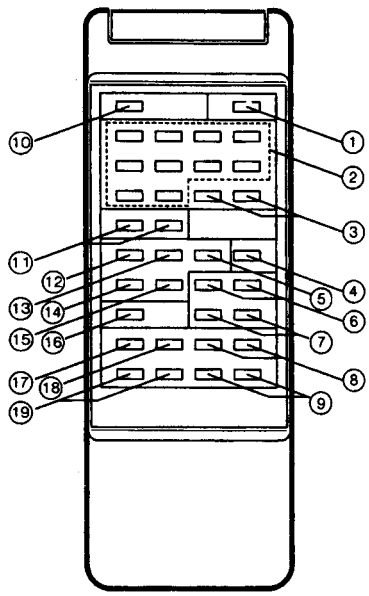
⑱ **Témoin de la semaine**
Il s'allume lors du réglage de la semaine (I → II → III → IV → HEB.).

⑲ **Témoin de ligne (AUX)**
Il s'allume lorsque la position de chaîne est réglée sur 0 pour recevoir les signaux externes.
Il s'allume lorsque la position de chaîne est réglée sur 45 à 49 pour recevoir les signaux CANAL PLUS.

⑳ Indique le numéro de la position de la chaîne au cours du préréglage des chaînes, le numéro de la chaîne au cours de la programmation par minuterie et la sélection des chaînes de télévision.

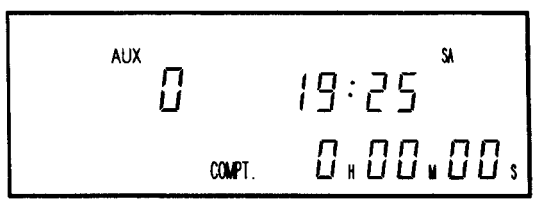
㉑ **Témoin VIDEO**
S'allume quand la touche TV/VIDEO est mise sur VIDEO.

UNITE DE TELECOMMANDE



① **Touche de mise sous tension/mise en attente (MARCHE)**
Cette touche est utilisée pour mettre le magnétoscope sous et hors tension.

② **Touches numériques**
Utilisées pour sélectionner directement une chaîne. Si l'on choisit une chaîne de 1 à 9, combiner l'usage de la touche 0 avec une des touches de 1 à 9, pour entrer des numéros de chaîne comme 01, 02, 03, etc.
Remarque:
Lors de la sélection des signaux audio et vidéo en provenance d'appareil audio et vidéo externes, choisir la position de chaîne 0 à l'aide des touches d'incrémentation/décrémentation, ou des 10 touches numériques. L'affichage fluorescent fait apparaître les indications suivantes:



Utilisées également pour spécifier un numéro d'indexation lors de la recherche à saut indexée (le numéro d'indexation à spécifier peut aller jusqu'à 99).

③ **Touches de sélection de chaîne (incrémentation/décrémentation) (PROG. TV)**
Lorsque la touche d'incrémentation est enfoncée, le balayage se déplace vers les chaînes supérieures. Lorsque la touche de décrémentation est enfoncée, le balayage se déplace vers les chaînes inférieures.

④ **Touche d'indexation (INDEX)**
Utilisée pour la recherche indexée et la recherche à saut indexée.

⑤ **Touche d'avance rapide**
Appuyer sur cette touche pour faire avancer rapidement la bande. En mode de lecture, une poussée sur cette touche permet de faire défiler rapidement les images.

⑥ **Touches de lecture au ralenti (RALENTI)**
Ces touches sont utilisées pour reproduire lentement les images. Appuyer sur la touche 1/12 pour procéder à une lecture à 1/12 de la vitesse normale et appuyer sur la touche 1/6 pour procéder à une lecture à 1/6 de la vitesse normale.

⑦ **Touches d'alignement en mode de lecture au ralenti (ALIGNEMENT)**
En mode de lecture au ralenti, si des bruits apparaissent sur l'écran, maintenir ces touches enfoncées jusqu'à obtention de la meilleure image possible.

⑧ **Touches de minuterie (AUTO.)**
Utilisée pour faire entrer le magnétoscope en mode d'exploitation par minuterie, plus particulièrement lors de l'enregistrement immédiat par minuterie et par enclenchement d'une seule touche. Lors des opérations pour l'enregistrement déclenché par minuterie, veiller à appuyer simultanément sur ces deux touches.

⑨ **Touches de réglage (+/−)**
Utiliser la touche de réglage (+) pour faire croître l'affichage des nombres lors du réglage de la date, de l'horloge et des programmations par minuterie. Utiliser la touche de réglage (−) pour faire décroître les nombres lors du réglage de la date, de l'horloge et des programmations par minuterie.

⑩ **Touche de téléviseur/magnétoscope (TV/VIDEO)**
Appuyer sur cette touche pour mettre le téléviseur ou magnétoscope en action.

⑪ **Touches d'enregistrement (ENR.)**
Appuyer sur ces touches pour lancer l'enregistrement. Le témoin ENR s'allume. Lors de l'enregistrement, veiller à appuyer simultanément sur ces deux touches.

⑫ **Touche de rebobinage**
Appuyer sur cette touche pour rebobiner rapidement les bandes. En mode de lecture, une poussée sur cette touche permet de reproduire rapidement les images en marche arrière.

⑬ **Touche d'arrêt (ARRET)**
Appuyer sur cette touche pour arrêter le défilement de la bande.

⑭ **Touche d'arrêt momentané (PAUSE/AR. IMAGE)**
Utilisée pour faire fonctionner le magnétoscope de trois manières:
A) Pour arrêter momentanément la bande en mode d'enregistrement.
B) Pour visionner une image fixe en mode de lecture.
C) Pour faire avancer les images une par une, en appuyant sur la touche LECT., après avoir enclenché cette touche.

⑮ **Touche de lecture (LECT.)**
Appuyer sur cette touche pour reproduire des cassettes pré-enregistrées, munies de leur segment de protection, ou pour reprendre la lecture de cassettes dépourvues de leur segment de protection, après que la fonction d'exploitation automatique a été interrompue. En mode d'image fixe, appuyer sur cette touche pour faire défiler les images une par une.

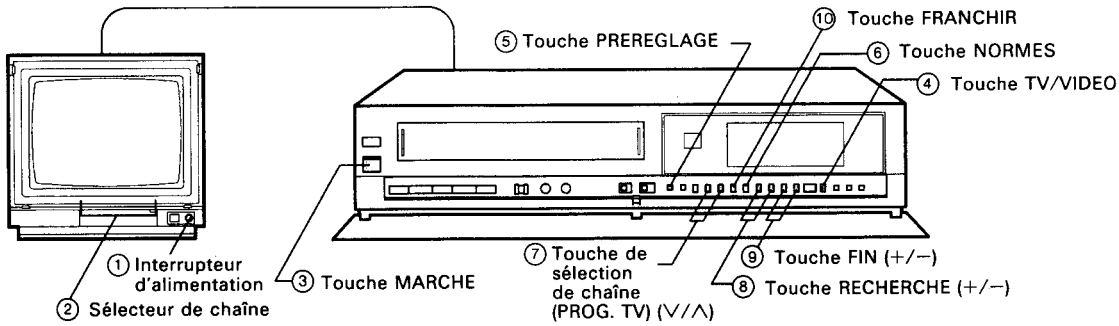
⑯ **Touche de bande restante/de compteur (RESTE /COMPT.)**
Utilisée pour passer de l'affichage du compteur à celui de la bande encore disponible.

⑰ **Touche de programmation sur l'écran (OSP)**
Appuyer sur cette touche pour activer la fonction OSP.

⑱ **Touche d'enregistrement immédiat par minuterie (ENR. IMMEDIAT)**
Utilisée pour procéder à un enregistrement, par tranches de 30 minutes, en mode normal (4 heures maximum).

⑲ **Touches d'étape (←/→)**
Utiliser ces touches pour changer la position du réglage pour la date, l'horloge et les programmations par minuterie. Utiliser la touche d'étape (←) pour déplacer le curseur vers la gauche et la touche d'étape (→), pour déplacer le curseur vers la droite.

SELECTION DES CHAINES

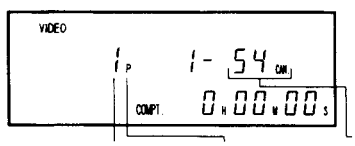


Le tuner incorporé dans le magnétoscope est un tuner avec fréquence synthétisée (FS) et est capable de recevoir les canaux V_L FB à FC, les canaux V_H F1 à F6 et B à Q, 70 à 86, les canaux UHF E21 à E69 et les canaux PAL V_H E2 à E12.
Les canaux peuvent être mémorisés sur les positions de canal de 1 à 44.
Lors de la sélection d'une station VHF/UHF ou d'un changement du fait d'un autre ordre, effectuer les démarches suivantes, dans l'ordre numérique.

ACCORD AUTOMATIQUE ET ACCORD MANUEL

Ce magnétoscope utilise deux systèmes d'accord, à savoir, l'accord automatique et l'accord "pas à pas" ou manuel. En général, utiliser le système d'accord automatique. Si certains canaux ne peuvent être syntonés par le système d'accord automatique, utiliser le système d'accord manuel.
Remarque: Pour l'allocation des canaux et gamme de réglage de fréquence spécifiée par la touche NORMES .
Exemple: Réglage d'une station UHF (ex. 26) sur la position 2

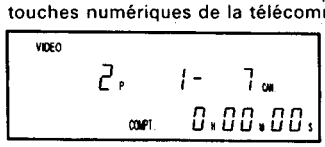
1. Commuter l'interrupteur d'alimentation ① du téléviseur sur marche et régler le canal de sortie du magnétoscope sur le sélecteur de chaîne de télévision ②.
2. Enclencher la touche MARCHE ③. Le témoin s'allume.
3. Ouvrir le logement avant du magnétoscope.
4. Mettre la touche TV/VIDEO ④ sur VIDEO.
5. Appuyer sur la touche PREREGLAGE ⑤.



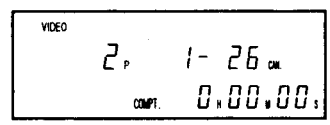
Position de la chaîne (1 à 49) — Témoin de préréglage — Numéro de chaîne (0 à 99)

Remarque: Les positions de canal 45 à 49 est réservée pour les émissions des programmes CANAL PLUS.

6. Choisir la réception SECAM (1-), CATV (2-) ou PAL (3-) à l'aide de la touche NORMES ⑥. Une poussée sur la touche NORMES fait changer l'affichage.
   1ère poussée: SECAM/CATV
   2ème poussée: CATV
   3ème poussée: PAL (le témoin PAL s'allume)
7. Régler la position de chaîne à prérégler à l'aide des touches de sélection de chaîne (PROG. TV) ⑦, ou les touches numériques de la télécommande ..... "2".



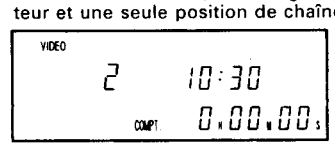
8. Appuyer sur les touches RECHERCHE (+/−) ⑧ suffisamment longtemps pour activer la fonction d'accord automatique. Les numéros des chaînes vont croître ou décroître, à partir du numéro 1 - 1, en fonction de la touche enfoncée. Si le signal est syntonisé, l'opération de balayage s'arrête automatiquement. Si la chaîne balayée n'est pas celle souhaitée, appuyer de nouveau sur les touches RECHERCHE (+/−) ⑧ pour relancer l'opération de recherche de chaîne.
   Si le canal que l'on veut mémoriser n'est pas préréglé par l'opréation ci-dessus, appuyer à plusieurs reprises sur les touches RECHERCHE (+/−) ⑧ jusqu'à ce que l'image du canal à mémoriser apparaisse sur l'écran.
   - Pour chercher dans les fréquences supérieures, appuyer sur la touche +.
   - Pour chercher dans les fréquences inférieures, appuyer sur la touche −.



9. Si la qualité de l'image est insatisfaisante, procéder à l'acccord fin à l'aide des touches FIN (+/−) ⑨.

Appuyer sur "+" jusqu'à obtention de la couleur. — Image optimale — Appuyer sur "−" jusqu'à disparition des bandes.

10. Répéter les étapes de 6 à 9 (44 positions disponibles).
11. Appuyer sur la touche PREREGLAGE ⑤. Lorsque cette touche est enfoncée, l'affichage fait apparaître le compteur et une seule position de chaîne.

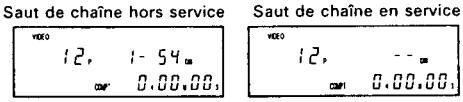


Saut de chaîne

Cette fonction permet d'ignorer les positions de chaîne que l'on ne souhaite pas syntoniser, lors de la sélection des positions de chaîne, à l'aide des touches de sélection de chaîne (PROG. TV) ⑦.

1. Appuyer sur la touche PREREGLAGE ⑤.
2. Choisir une position de chaîne à ignorer à l'aide des touches de sélection de chaîne (PROG. TV) ⑦.
3. Appuyer sur la touche FRANCHIR ⑩. Les indications ci-dessous apparaissent lorsque la touche FRANCHIR est enclenchée et libérée.

Saut de chaîne hors service — Saut de chaîne en service



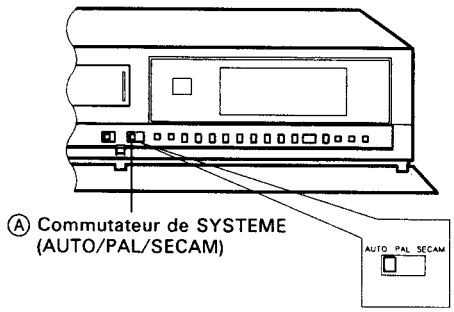
4. Appuyer sur la touche PREREGLAGE ⑤.

Remarques:

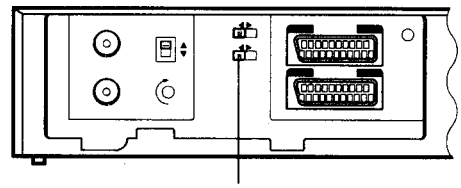
1. Il est impossible d'effectuer le saut de chaîne en mode de réglage des chaînes.
2. La sélection de chaîne directe est aussi possible même en mode de saut de chaîne.
3. Pour libérer la fonction de saut de chaîne, procéder aux étapes de 1 à 4, tout comme pour le réglage du saut de chaîne.

COMMUTATEUR DE SYSTEME

Cet appareil peut enregistrer et reproduire les systèmes couleur PAL et SECAM choisissant la position à l'aide de l'interrupteur SYSTEM Ⓐ et peut utiliser avec un téléviseur duel et un téléviseur SECAM à l'aide de l'interrupteur SYSTEM TV Ⓑ. Pour exploiter correctement cet appareil, prière de lire attentivement les paragraphes suivants, afin de se familiariser avec les fonctions des différents interrupteurs. En outre, avant de faire fonctionner cet appareil, vérifier que tous les interrupteures sont commutés sur leur position adéquate, en fonction de l'utilisation envisagée.



Ⓐ Commutateur de SYSTEME (AUTO/PAL/SECAM)



Ⓑ Commutateur de SYSTEME TV (AUTO/SECAM)

Ⓐ Commutateur de SYSTEME (situé sur le panneau frontal)

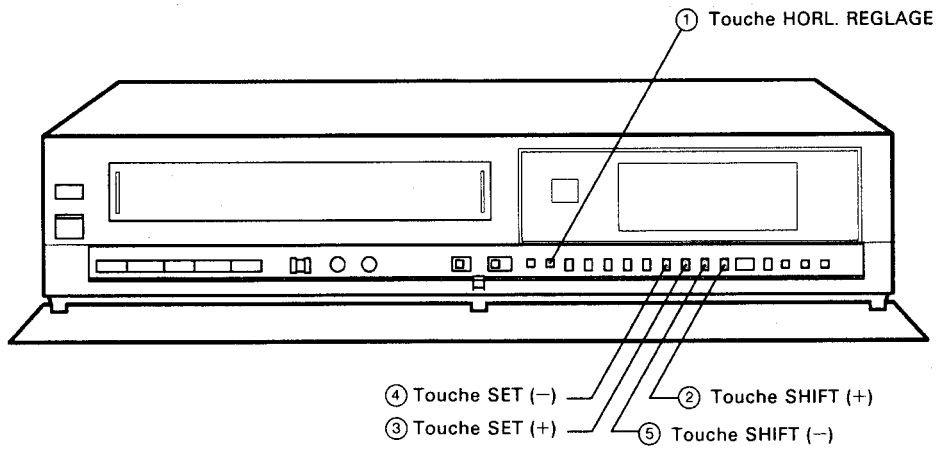
Position du commutateur	Enregistrement	Lecture
Auto AUTO PAL SECAM	Enregistrement par détection automatique du système PAL/SECAM	Lecture par détection automatique du système PAL/SECAM
Position normale pour l'enregistrement et la lecture		
PAL AUTO PAL SECAM	Sélection manuelle pour l'enregistrement PAL.	Sélection manuelle pour la lecture PAL.
Cette sélection manuelle est utilisée lorsque la détection automatique du système PAL/SECAM ne fonctionne pas dans les zones limitrophes, ou dans le cas d'un enregistrement de mauvaise qualité.		
SECAM AUTO PAL SECAM	Sélection manuelle pour l'enregistrement SECAM.	Sélection manuelle pour la lecture SECAM.
Cette sélection manuelle est utilisée lorsque la détection automatique du système PAL/SECAM ne fonctionne pas dans les zones limitrophes, ou dans le cas d'un enregistrement de mauvaise qualité.		

Ⓑ Commutateur de SYSTEME TV (situé sur le panneau arrière)

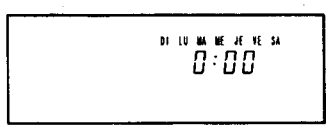
Position du commutateur	Sortie RF	AUDIO/VIDEO à 21 broches
AUTO AUTO SECAM	Sortent le système PAL(G) ou SECAM (G) lors de la réception ou de la lecture.	Sortent le système PAL ou SECAM lors de la réception ou de la lecture.
Raccorder à PAL/SECAM TV.		
SECAM AUTO SECAM	Sortent le système SECAM (L) lors de la réception ou de la lecture.	Sortent le système PAL ou SECAM lors de la réception ou de la lecture.
Utiliser avec un téléviseur SECAM.		

Remarque:
Vérifier les différentes positions des interrupteurs du téléviseur et du magnétoscope.

REGLAGE DE L'HEURE ET DE LA DATE SUR LE MAGNETOSCOPE

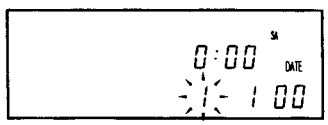


Lorsque le cordon d'alimentation est branché pour la première à une prise secteur, ou après une interruption d'alimentation, l'indication DI ... SA 0:00 clignote sur l'affichage, comme illustré.

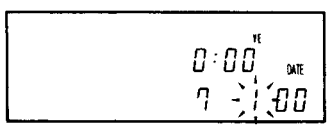


Exemple: Pour régler JE 19:25 (mercredi, 19:25), le 7 Juin 1989.

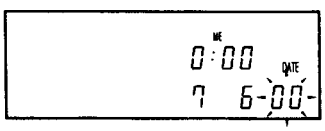
1. Appuyer sur la touche HORL. REGLAGE ① pour régler l'appareil en mode de réglage de l'heure.



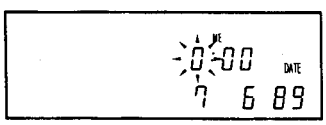
   Appuyer sur la touche SET (+) ③ pour faire apparaître "7" sur la position du jour.
2. Appuyer sur la touche SHIFT (+) ② pour faire clignoter la position de l'indication du mois.



   Appuyer sur la touche SET (+) ③ pour faire apparaître "6" sur la position du mois.
3. Appuyer sur la touche SHIFT (+) ② pour faire clignoter la position de l'indication de l'année.

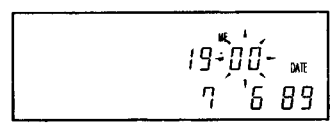


   Appuyer sur la touche SET (+) ③ pour faire apparaître "89" sur la position de l'année.
4. Appuyer sur la touche SHIFT (+) ② pour faire clignoter la position de l'indication de l'heure.



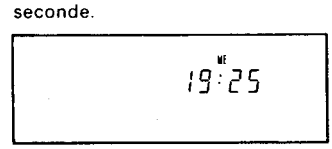
   Appuyer sur la touche SET (+) ③ pour faire apparaître "19" sur la position de l'heure.

   Remarque:
   Dès que l'année, le mois et le jour ont été posés, le jour de la semaine est automatiquement choisi, grâce au calendrier incorporé.
5. Appuyer sur la touche SHIFT (+) ② pour faire clignoter la position de l'indication des minutes.



   Appuyer sur la touche SET (+) ③ pour faire apparaître "25" sur la position des minutes.

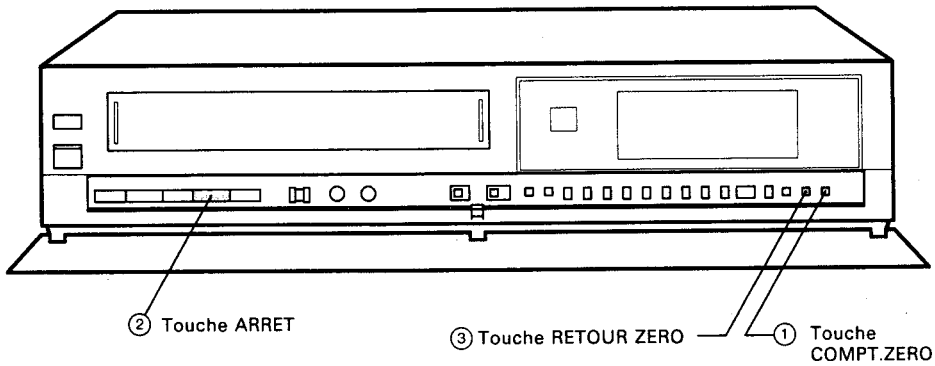
   Remarques:
   1. Si la touche SET (+/–) ③, ④ est enfoncée une fois, les chiffres avancent d'une unité à la fois. Si la touche est maintenue enfoncée, les chiffres défilent rapidement.
   2. Si l'on dépasse le moment souhaité par inadvertance, utiliser la touche SET (–) ④ pour revenir sur l'heure et les minutes.
   3. Si l'on souhaite modifier une indication antérieure à celle où l'on se trouve, utiliser la touche SHIFT (–) ⑤ pour revenir sur le poste antérieur à modifier.
6. Appuyer sur la touche HORL. REGLAGE ① pour faire apparaître l'heure réelle. Lorsque cette touche est enfoncée, l'horloge se met à fonctionner, à partir de zéro seconde.



   Pour synchroniser l'horloge avec le top horaire de la radio, appuyer sur la touche HORL. REGLAGE ① lorsque la dernière tonalité du top horaire retentit.

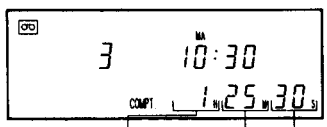
   Remarques:
   1. Après avoir enclenché la touche HORL. REGLAGE ①, l'indication de l'année, du mois et du jour disparaissent.
   2. Si l'on souhaite faire apparaître l'année, le mois et le jour après avoir posé la date et l'heure sur le magnétoscope, appuyer de nouveau sur la touche HORL. REGLAGE ①.

COMPTEUR LINEAIRE ET RETOUR A ZERO



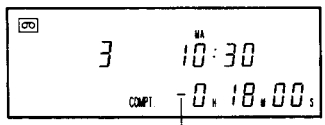
COMPTEUR LINEAIRE

Ce magnétoscope utilise un compteur de temps linéaire. Ce type de compteur affiche, à la seconde près, la longueur du défilement de la bande. Si la bande défile une heure, vingt-cinq minutes et trente secondes:



Indication de l'heure — Indication des minutes — Indication des secondes

Si la bande est rebobinée au delà de l'indication "0H00M00S":



Indication négative (—)

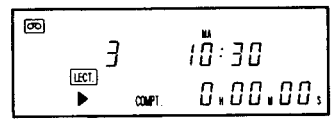
Remarques:

1. Lorsque la cassette est enlevée par poussée sur la touche EJECT., le compteur linéaire revient à "0H00M00S".
2. Si le compteur s'arrête de fonctionner à certains endroits de la bande, pendant le rebobinage ou l'avance rapide, ceci est dû au fait que ces passages sont des passages non enregistrés.
3. Le relevé du compteur ne change pas lors de passages non enregistrés.

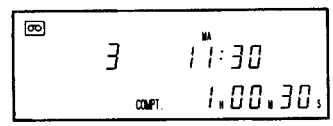
RETOUR A ZERO

Cette fonction est très pratique pour localiser facilement des scènes à reproduire plus tard.
Il est possible de régler le magnétoscope de sorte que la bande s'arrête aux alentours de la position "0H00M00S", en mode de rebobinage ou d'avance rapide.

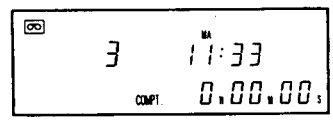
1. Appuyer sur la touche COMPT.ZERO ① au point où l'on souhaite reprendre plus tard la lecture, pendant que le magnétoscope se trouve en mode d'enregistrement ou de lecture.



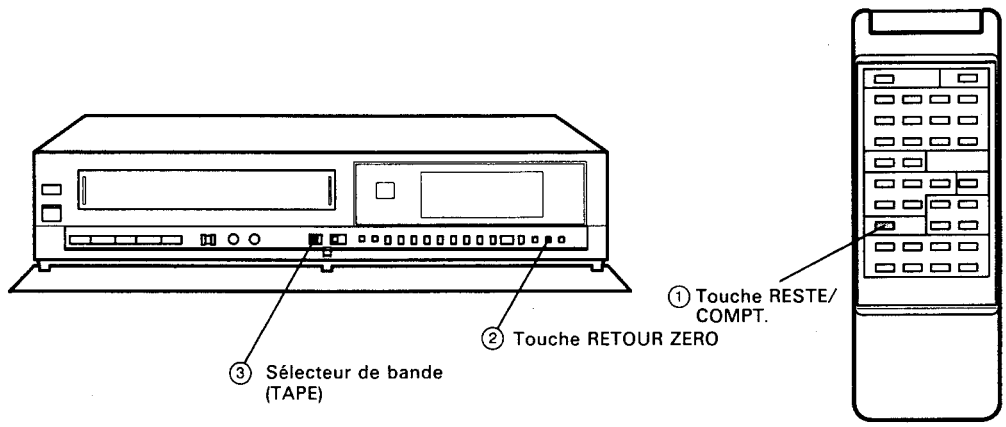
2. Appuyer sur la touche ARRET ② pour arrêter la bande après que l'enregistrement ou la lecture est terminé.



3. Appuyer sur la touche RETOUR ZERO ③.
   La bande se rebobine jusqu'à la position "0H00M00S"
   sur le compteur. Lorsque la touche RETOUR ZERO est enfoncée après que la bande a été rebobinée, mais avant la position 0H00M00S, la bande va défiler rapidement vers l'avant jusqu'aux alentours de 0H00M00S, avant de s'arrêter.

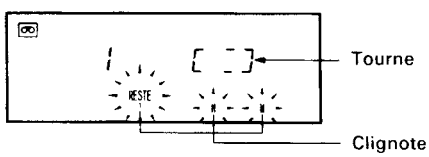


AFFICHAGE DE BANDE RESTANTE

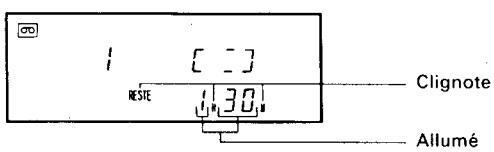


AFFICHAGE DE BANDE RESTANTE EN MODE D'ARRET

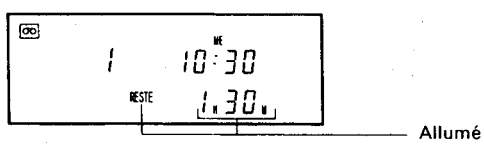
Appuyer sur la touche RESTE/COMPT. ①. L'affichage change comme suit.
Pendant le comptage de la durée restante:
L'affichage de l'heure réelle disparaît pour faire place à l'affichage du compteur (remarquer que l'affichage de la durée restante apparaît pendant 5 secondes environ).



Le comptage est accompli:
La durée de bande restante est affichée. La bande se rebobine à sa position originale.



Lorsque la bande est rebobinée à sa position d'origine, l'affichage fait réapparaître l'heure réelle.



Une poussée sur la touche après le comptage va faire apparaître le relevé du contenu de la bande. Ceci ne constitue en aucun cas un mauvais fonctionnement de l'appareil.

AFFICHAGE DE BANDE RESTANTE EN MODE D'ENREGISTREMENT OU DE LECTURE

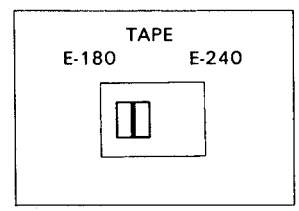
La durée de bande restante peut être affichée même en mode d'enregistrement ou de lecture.

1. La durée de bande restante est calculée automatiquement au cours de l'enregistrement ou de la lecture et est affichée par poussée sur la touche RESTE/COMPT. ①.
2. Si la touche RESTE/COMPT. ① est enclenchée immédiatement après le début de l'enregistrement ou de la lecture, la durée de bande restante va apparaître après une demi-minute environ.

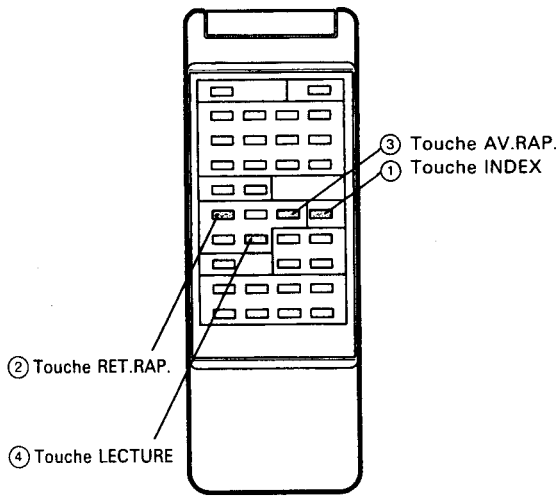
Remarques:

1. L'affichage de bande restante repasse à l'affichage du compteur dans les cas suivants: lorsque le magnétoscope entre en mode de rebobinage ou d'avance rapide, lorsque la touche RETOUR ZERO ② est enfoncée et lorsque la cassette est éjectée.
2. En mode de rebobinage ou d'avance rapide, même si la touche RESTE/COMPT. est enfoncée, l'affichage du compteur ne fait pas place à l'affichage de bande restante.
3. L'affichage de bande restante évalue approximativement la durée encore disponible sur la bande.
4. Régler le sélecteur de bande (TAPE) ② sur la position correcte en fonction de la bande à utiliser. Placer le sélecteur sur la position E-180 lorsqu'on utilise une bande plus courte que les bandes E-180. Placer le sélecteur sur la position E-240 lorsqu'on utilise une bande E-240.

Sélecteur de bande



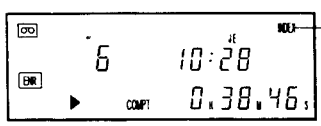
RECHERCHE INDEXEE



Ce magnétoscope possède une fonction de recherche indexée VHS. Il peut effectuer aisément les opérations de recherche indexée et de recherche à saut, à condition d'utiliser des cassettes contenant des signaux d'indexation. Il existe deux types de système de recherche indexée, à savoir, la recherche indexée et la recherche à saut. Dans le cas de la recherche indexée, les 5 premières secondes de chaque programme enregistré sont reproduites. Dans le cas de la recherche à saut, on peut localiser un programme souhaité.
Au début de la bande destinée à l'enregistrement, des signaux d'indexation sont automatiquement placés, dès que la touche ENR. est enfoncée. Au cours de l'enregistrement, il est aussi possible d'utiliser la touche INDEX pour placer des signaux d'indexation à des endroits définis, en suivant les démarches ci-dessous.

Enregistrement de signaux d'indexation au cours de l'enregistrement

Lorsqu'on souhaite enregistrer un signal d'indexation sur la bande, appuyer sur la touche INDEX de la télécommande.



Reste allumé pendant 3 secondes

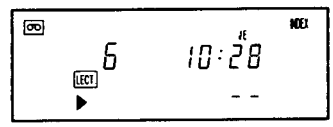
Remarques:

1. Si le défilement de la bande est interrompu par un arrêt momentané, puis suivi d'une lecture de la bande, aucun signal d'indexation ne sera enregistré à cet endroit. Par conséquent, appuyer sur la touche INDEX de la télécommande.
2. Le programme qui a été enregistré au tout début de la bande risque de ne pas être correctement localisé par la fonction de recherche indexée.
3. Au cours de l'enregistrement, veiller à laisser un intervalle de plus d'une minute entre les enclenchements de la touche INDEX.
4. Pendant l'enregistrement déclenché par minuterie et par une seule touche, ainsi que pendant l'enregistrement déclenché par minuterie, le signal d'indexation va être enregistré automatiquement. Cependant, en mode d'enregistrement continu, aucun signal d'index n'est enregistré dans une portion ininterrompue.

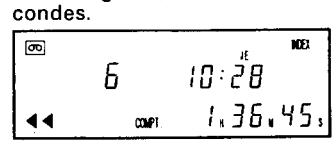
RECHERCHE INDEXEE

Cette fonction permet de reproduire, pendant 5 secondes, une section contenant un signal d'indexation, lorsque la bande est rebobinée ou avancée rapidement.

1. Insérer une bande qui contient des signaux d'indexation et placer le magnétoscope en mode LECTURE ou ARRET. Appuyer sur la touche INDEX ① de la télécommande.



2. Appuyer sur la touche RET.RAP. ② ou la touche AV.RAP. ③ dans les 10 secondes qui suivent. La bande s'arrête au point où le signal d'indexation a été enregistré, et lance sa lecture pendant 5 secondes.



(L'affichage illustré ci-dessus est celui en mode de rebobinage)

3. Appuyer sur la touche LECTURE ④ lorsque le programme souhaité apparaît.

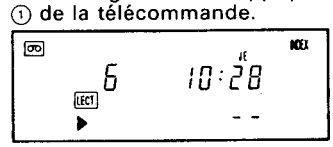
Remarque:

Si l'on enregistre des signaux d'indexation sur une bande enregistrée sur un autre magnétoscope, cet enregistrement risque de se voiler et la fonction de recherche indexée risque de ne pas fonctionner normalement.

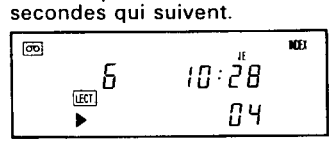
RECHERCHE A SAUT

Cette fonction permet de reproduire une portion de la bande délimitée par des signaux d'indexation.

1. Insérer une bande contenant des signaux d'indexation et placer le magnétoscope en mode de lecture ou d'enregistrement. Appuyer sur la touche INDEX ① de la télécommande.



2. Spécifier le numéro d'indexation par les touches numéri ques sur la télécommande, dans les 10 secondes qui suivent.

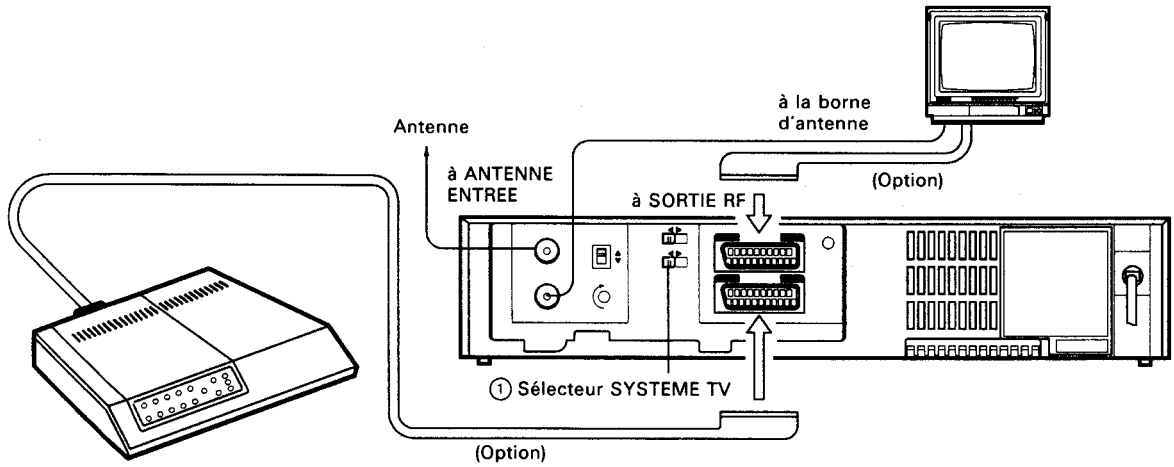


3. Appuyer sur la touche RET.RAP. ② ou la touche AV.RAP. ③ dans les 10 secondes qui suivent. La bande s'arrête au point spécifié par le signal d'indexation et lance automatiquement sa lecture. L'affichage du numéro d'indexation fait ensuite place à l'affichage du compteur d'indexation.

Remarques:

1. Il est possible de spécifier un numéro d'indexation jusqu'à 99.
2. Le numéro de l'affichage d'indexation diminue d'une unité chaque fois qu'un signal d'indexation est sauté.
3. Dans certains cas, il est impossible d'activer la fonction de recherche à saut dans un programme enregistré au tout début de la bande.

ENREGISTREMENT DES PROGRAMMES CANAL PLUS



Ce magnétoscope est équipé de deux types de prises PERITEL 21 broches, l'une connecteur AUDIO/VIDEO et l'autre connecteur C.+.
Si l'on raccorde le connecteur AUDIO/VIDEO au téléviseur et le connecteur C.+ DECODEUR au décodeur CANAL PLUS, il devient alors facile de regarder alternativement les images de l'émission en cours de visionnage et les images de l'émission en cours d'enregistrement, simplement en appuyant sur la touche TV/VIDEO.
Raccorder le magnétoscope comme illustré et placer le sélecteur SYSTEME TV ① sur AUTO.
Les cordons PERITEL nécessaires, ne sont pas livrés avec le magnétoscope.

- **Enregistrement des programmes de télévision normaux en regardant les programmes de CANAL PLUS.**

1. Mettre la touche TV/VIDEO sur VIDEO.
2. Choisir le programme de télévision normal (1 à 44) que l'on souhaite enregistrer, à l'aide de la touche de sélection de chaîne sur le panneau avant du magnétoscope.
3. Appuyer sur la touche ENR.
4. Mettre la touche TV/VIDEO sur TV.
5. Choisir le programme CANAL PLUS que l'on souhaite regarder, à l'aide du sélecteur de chaîne sur la télécommande du téléviseur.

- **Enregistrement des programmes CANAL PLUS en regardant des programmes de télévision normaux.**

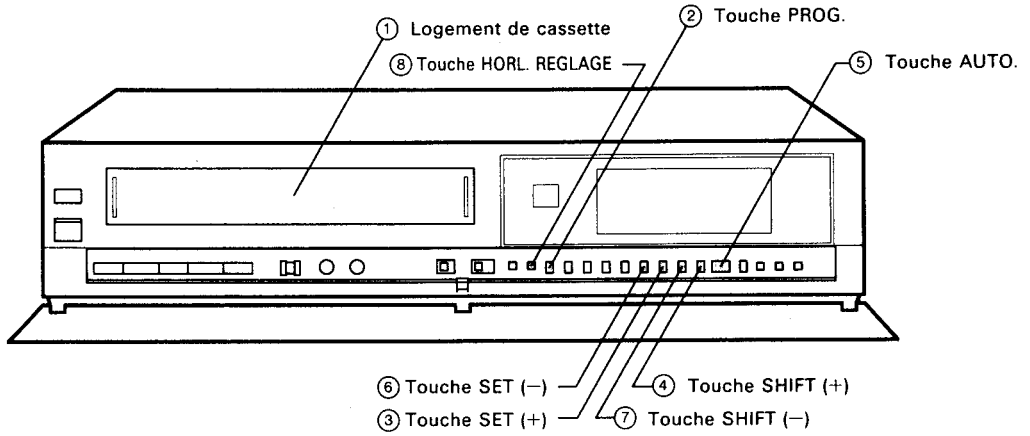
1. Mettre la touche TV/VIDEO sur VIDEO.
2. Choisir le programme CANAL PLUS (45 à 49) que l'on souhaite enregistrer, à l'aide de la touche de sélection de chaîne sur le panneau avant du magnétoscope.
3. Appuyer sur la touche ENR.
4. Mettre la touche TV/VIDEO sur TV.
5. Choisir le programme de télévision normal que l'on souhaite regarder, à l'aide du sélecteur de chaîne, sur la télécommande du téléviseur.

- Enregistrement d'un programme de télévision normal en regardant un autre programme de télévision normal.

1. Mettre la touche TV/VIDEO sur VIDEO.
2. Choisir le programme de télévision normal que l'on souhaite enregistrer, à l'aide de la touche de sélection de chaîne sur le panneau avant du magnétoscope.
3. Appuyer sur la touche ENR.
4. Mettre la touche TV/VIDEO sur TV.
5. Choisir l'autre programme de télévision normal que l'on souhaite regarder, à l'aide du sélecteur de chaîne sur la télécommande du téléviseur.

Remarque:
Pour plus de détails sur ce système, consulter une agence Toshiba.

ENREGISTREMENT DECLENCHE PAR MINUTERIE



La minuterie de ce magnétoscope peut mémoriser huit programmations préréglées, sur 4 semaines (28 jours). Ces programmations peuvent être destinées à un enregistrement unique, à un enregistrement quotidien, à la même heure, ou à un enregistrement, le même jour de la semaine. L'horloge fonctionne sur cycle de 24 heures. En outre, ce magnétoscope permet de régler la minuterie sur 28 jours et de lancer un enregistrement par minuterie, par simple poussée sur la touche AUTO. Il permet également de sélectionner le jour de la semaine souhaité, par six réglages.
Deux moyens de préréglage de la minuterie sont disponibles. Le premier permet de programmer la minuterie en observant l'affichage fluorescent et l'autre permet d'utiliser l'affichage sur l'écran.
Le réglage des programmes par la fonction OSP (programmation sur l'écran) est décrite en détails dans le manuel OSP ci-joint. Il est recommandé de choisir la méthode OSP pour effectuer plus facilement et plus sûrement le réglage de programme.

- Le nombre des programmes qui peuvent se régler sur l'appareil principal et sur la télécommande s'élève à huit en tout.

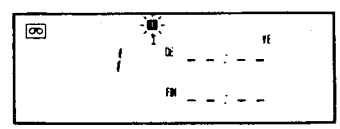
FONCTIONNEMENT

Progammation de la minuterie tout en surveillant l'affichage fluorescent

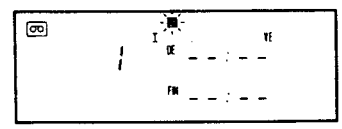
1. Vérifier l'heure réelle. Si l'horloge n'est pas à l'heure, la régler .
2. Insérer une cassette dans le logement ① (vérifier si la cassette est bien munie de son segment de protection).
3. Régler le magnétoscope de sorte qu'il entre en mode de programmation par minuterie en pressant sur la touche PROG. ②.
4. Spécifier le numéro de programmation par la touche SET (+) ③.
5. Appuyer sur la touche SHIFT (+) ④.
   Le clignotement se déplace sur l'indication de la chaîne. Appuyer sur la touche SET (+) ③ pour faire clignoter la position de chaîne souhaitée.
6. Appuyer sur la touche SHIFT (+) ④.
   Le clignotement se déplace sur l'indication de la semaine. Appuyer sur la touche SET (+) ③ pour faire clignoter la semaine souhaitée.
7. Appuyer sur la touche SHIFT (+) ④.
   Le clignotement se déplace sur l'indication du jour. Appuyer sur la touche SET (+) ③ pour faire clignoter le jour souhaité.
8. Appuyer sur la touche SHIFT (+) ④.
   Le clignotement se déplace sur l'indication de l'heure de la mise en marche. Appuyer sur la touche SET (+) ③ pour choisir l'heure de la mise en marche souhaitée.
9. Appuyer sur la touche SHIFT (+) ④.
   Le clignotement se déplace sur l'indication des minutes de la mise en marche. Appuyer sur la touche SET (+) ③ pour choisir les minutes de la mise en marche souhaitées.
10. Appuyer sur la touche SHIFT (+) ④.
    Le clignotement se déplace sur l'indication de l'heure de la mise à l'arrêt. Appuyer sur la touche SET (+) ③ pour choisir l'heure de la mise à l'arrêt souhaitée.
11. Appuyer sur la touche SHIFT (+) ④.
    Le clignotement se déplace sur l'indication des minutes de la mise à l'arrêt. Appuyer sur la touche SET (+) ③ pour choisir les minutes de la mise à l'arrêt souhaitée.
12. Pour continuer à prérégler les programmations, appuyer sur la touche SHIFT (+) ④ et répéter les étapes de 4 à 11.
13. Appuyer sur la touche AUTO. ⑤.

Exemple: Pour prérégler la chaîne 25 à la programmation n° 2, de 13:30 à 14:20, mardi prochain (date du jour: vendredi le 21 juillet 1989 à 9:00).

1. Appuyer sur la touche PROG. ② pour entrer en mode de programmation par minuterie.

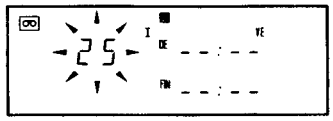


2. Appuyer sur la touche SET (+) ③ pour régler la position "2".

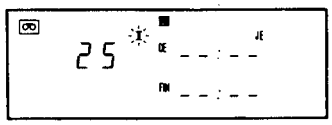


ENREGISTREMENT DECLENCHE PAR MINUTERIE

3. Appuyer sur la touche SHIFT (+) ④. L'indication de la chaîne se met à clignoter. Régler la chaîne sur "25" par la touche SET (+) ③.



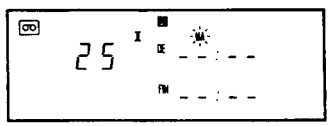
4. Appuyer sur la touche SHIFT (+) ④. L'indication de la semaine se met à clignoter. Régler la semaine sur la position "II" par la touche SET (+) ③.



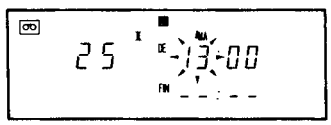
Remarques:

1. Si l'on a dépassé par inadvertance le moment souhaité ou la position du réglage, utiliser la touche SET (−) ⑥ pour afficher l'indication correcte.
2. Si l'on souhaite revenir sur un réglage antérieur, appuyer sur la touche SHIFT (−) ⑦.

5. Appuyer sur la touche SHIFT (+) ④. L'indication du jour se met à clignoter. Régler le jour sur la position "MA" par la touche SET (+) ③.



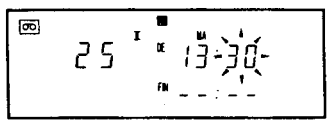
6. Appuyer sur la touche SHIFT (+) ④. L'indication de l'heure de la mise en marche se met à clignoter. Régler l'heure de la mise en marche sur "13" par la touche SET (+) ③.



Remarque:

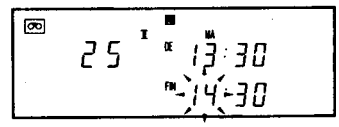
Si la touche SET (+) ③ ou SET (−) ⑥ est enfoncée une fois, l'heure réelle va apparaître sur la position de l'heure de la mise en marche.

7. Appuyer sur la touche SHIFT (+) ④. L'indication des minutes de la mise en marche se met à clignoter. Régler les minutes de la mise en marche sur "30" par la touche SET (+) ③.

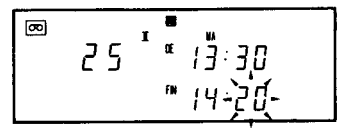


8. Appuyer sur la touche SHIFT (+) ④. L'indication de l'heure de la mise à l'arrêt se met à clignoter. Régler l'heure de la mise à l'arrêt sur "14" par la touche SET (+) ③.

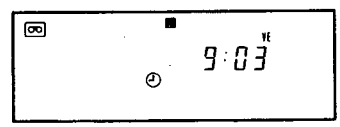
Si la touche SET (+) ③ ou SET (−) ⑥ est enfoncée une fois, l'heure de la mise en marche va apparaître sur la position de l'heure de la mise à l'arrêt.



9. Appuyer sur la touche SHIFT (+) ④. L'indication des minutes de la mise à l'arrêt se met à clignoter. Régler les minutes de la mise à l'arrêt sur "20" par la touche SET (+) ③.



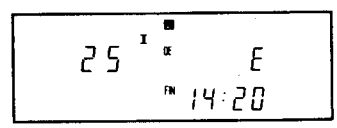
10. Appuyer sur la touche AUTO. ⑤.



(L'horloge du magnétoscope continue à fonctionner pendant le réglage de la minuterie.)

Remarques:

1. Il est impossible d'effectuer un enregistrement par minuterie s'il n'y a pas de cassette dans le logement.

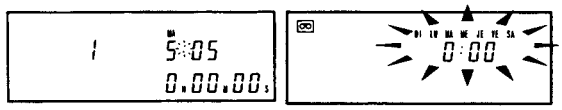


2. Si le segment de protection de la cassette a été brisé, il est également impossible de réaliser un enregistrement par minuterie. Dans ce cas, la cassette est automatiquement éjectée.
3. Pendant l'enregistrement déclenché par minuterie, le contenu du préréglage, c'est-à-dire, le numéro de la programmation, la chaîne, le jour de la semaine ou le moment de la mise en marche/mise à l'arrêt, ne peut plus être modifié.
4. Les réglages de la programmation restent valides jusqu'à leur accomplissement.
5. Après une interruption d'alimentation, les indications suivantes apparaissent sur l'affichage fluorescent.
   (1) Lorsque les deux points clignotent (voir fig. 1), le contenu des programmations reste valide. Appuyer sur la touche HORL. REGLAGE ⑧ pour s'assurer que l'horloge indique l'heure exacte. Pour afficher l'heure réelle, appuyer de nouveau sur cette touche.

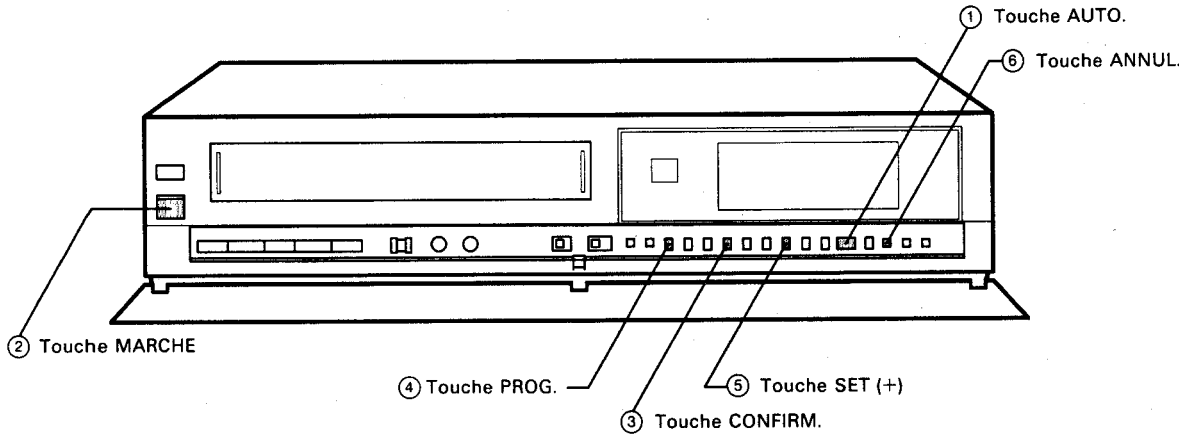
ENREGISTREMENT DECLENCHE PAR MINUTERIE

(2) Lorque l'affichage de l'horloge clignote (voir fig. 2), les programmations préréglées ne sont plus utilisables. Dans ce cas, remettre l'horloge du magnétoscope à l'heure et recommencer le réglage des programmations depuis le début.

(1) (2)



6. Pour procéder à un autre réglage de programmation après l'étape 9 (voir page 25), appuyer sur les touches SHIFT (+/−) ④ et ⑦ pour sélectionner la position du numéro de la programmation et poser le numéro de la programmation par la touche SET (+) ③.
7. Il est possible de procéder à la programmation par minuterie en mode d'attente.



UTILISATION DU MAGNETOSCOPE APRES AVOIR ACCOMPLI LES REGLAGES DE LA PROGRAMMATION DECLENCHEE PAR MINUTERIE

1. Appuyer sur la touche AUTO. ① pour libérer le mode de minuterie.
2. Appuyer sur la touche MARCHE ② pour mettre le magnétoscope sous tension.
3. Après usage, veiller à appuyer sur la touche CONFIRM. ③ pour vérifier le contenu des programmations mémorisées.
4. Pour entrer à nouveau en mode de minuterie, appuyer sur la touche AUTO. ①.

ANNULATION DE LA PROGRAMMATION DECLENCHEE PAR MINUTERIE

1. Appuyer sur la touche PROG. ④ pour entrer en mode de programmation par minuterie.
2. Spécifier la programmation dans laquelle se trouvent les données à effacer, par la touche SET (+) ⑤.
3. Appuyer sur la touche ANNUL. ⑥. Les réglages du moment de la mise à l'arrêt et de la chaîne sont effacés.

VERIFICATION DE LA PROGRAMMATION DECLENCHEE PAR MINUTERIE

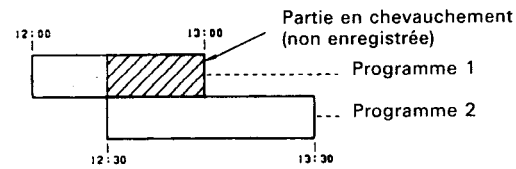
La méthode suivante permet de vérifier les données préréglées dans la programmation déclenchée par minuterie.

1. Appuyer sur la touche CONFIRM. ③.
   Le contenu des programmations de 1 à 8 (moments de mise en marche et de mise à l'arrêt) précédemment mémorisé va apparaître sur l'affichage fluorescent, de manière continue.

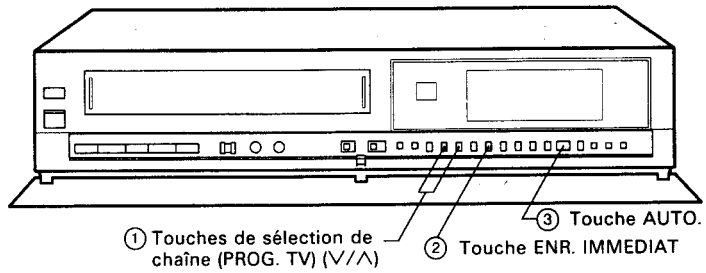
Remarque :
La vérification de programme s'effectue également de manière visuelle en utilisant la fonction OSP, disponible uniquement sur la télécommande.

CHEVAUCHEMENT DES PROGRAMMATIONS

Veillez à ce que les programmations ne se chevauchent pas. Si le cas se présente, le moment de la mise en marche est prioritaire et, de cette manière, le reste de la programmation qui est cachée par une autre ne sera pas enregistré (voir l'illustration ci-dessous).



ENREGISTREMENT PAR MINUTERIE A UNE TOUCHE

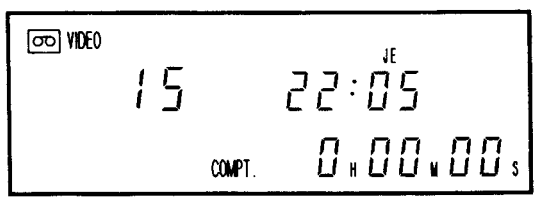


Ce magnétoscope possède une touche de fonction d'enregistrement à une touche. Cette fonction permet d'enregistrer par périodes de 30 minutes jusqu'à 4 heures maximum.
Une fois l'enregistrement terminé, l'appareil se met hors tension automatiquement. De plus, lors du réglage de la minuterie, l'heure de fin peut être réglée par périodes de 30 minutes. Le mode d'enregistrement à une touche (ENR. IMMEDIAT) prend la priorité sur les autres modes de fonctionnement du magnétoscope. Par exemple, lorsque le mode ENR. IMMEDIAT est activé alors que le magnétoscope est en mode de minuterie, le magnétoscope retournera automatiquement en mode de minuterie une fois le mode ENR. IMMEDIAT terminé.

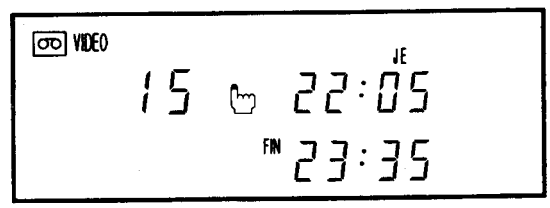
FONCTIONNEMENT DE L'ENREGISTREMENT PAR MINUTERIE A UNE TOUCHE

Exemple: Enregistrement du canal 15 à partir de maintenant pendant 1 heure et demie, le jeudi, à 22:05.

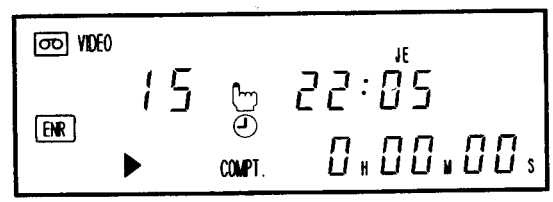
1. Sélectionner le canal 15 en appuyant sur les touches de sélection de chaîne (PROG. TV) (V/Λ) ①.



2. Appuyer sur la touche ENR. IMMEDIAT ② pour régler l'heure d'enregistrement.
   Lorsque la touche ENR. IMMEDIAT ② est actionnée une fois, 22:35 (30 minutes)
   Lorsque la touche ENR. IMMEDIAT ② est actionnée deux fois, 23:05 (1 heure)
   Lorsque la touche ENR. IMMEDIAT ② est actionnée trois fois, 23:35 (1 heure et 30 minutes)



3. Appuyer sur la touche AUTO. ③ dans un intervalle de 9 secondes.



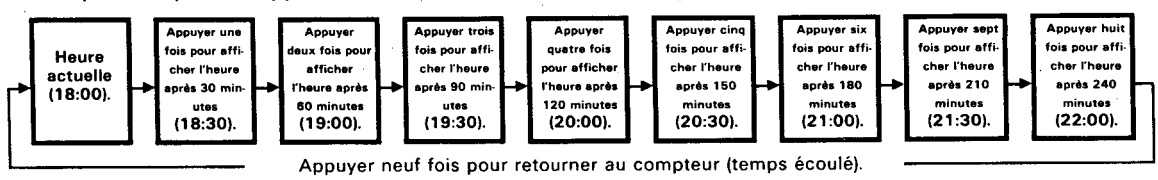
Remarques:

1. Trentes minutes sont ajoutées chaque fois que la touche ENR. IMMEDIAT ② est actionnée jusqu'à un maximum de quatre heures (huit poussées) (l'enregistrement de minuterie à une touche ne peut être réglé que par incréments de 30 minutes).
2. Le fonctionnement de l'enregistrement par minuterie à une touche n'est possible que lorsque le magnétoscope est sous tension et qu'il se trouve en mode d'horloge.
3. La fonction de l'enregistrement par minuterie à une touche a la priorité sur toute opération de fonctionnement (lecture, enregistrement, minuterie, etc.)

Indication d'erreur

Lorsque la touche AUTO. ③ est actionnée sans qu'il y ait de réglage de l'heure de début/fin de minuterie ou sans qu'il y ait de cassette dans le compartiment, le témoin "E" s'allume (pendant que la touche AUTO. ③ est actionnée).

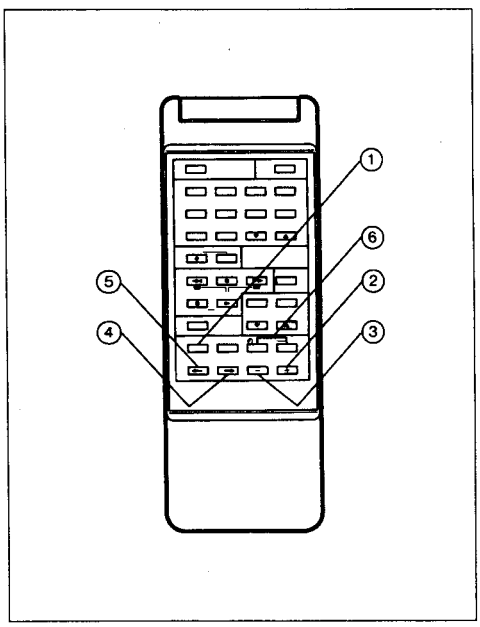
- **Chaque fois que l'on appuie sur la touche ENR. IMMEDIAT ②, les indications changent comme suit.**



MODE D'EMPLOI
POUR LA FONCTION OSP (V-209F/259F/269F/490F)

Ce mode d'emploi décrit uniquement les opérations des fonctions OSP. Pour les autres opérations de ce magnétoscope, se reporter au mode d'emploi. Les points suivants illustrent les quatre affichages d'écran réglables par la télécommande.

1. Affichage du réglage de l'horloge
2. Affichage de mise à l'heure de l'horloge
3. Affichage de réglage de programme de la minuterie
4. Affichage de calendrier



FONCTIONS DES COMMANDES UTILISEES PAR LA FONCTION OSP

① **Touche OSP**
Utilisée pour mettre la fonction OSP en et hors service et pour changer le mode OSP.

② **Touche +**
Utilisée pour faire augmenter les chiffres du réglage de l'affichage d'écran sélectionné.

③ **Touche −**
Utilisée pour faire diminuer les chiffres du réglage de l'affichage d'écran sélectionné.

④ **Touche →**
Utilisée pour choisir le menu désiré dans l'affichage de menu. Egalement utilisée pour déplacer le curseur vers la droite de l'affichage.

⑤ **Touche ←**
Utilisée pour choisir le menu désiré dans l'affichage de menu. Egalement utilisée pour déplacer le curseur vers la gauche de l'affichage.

⑥ **Touches AUTO.**
Utilisées pour faire entrer le magnétoscope en mode de minuterie, après avoir programmé les données de programme. Veiller à enfoncer simultanément la touche de sécurité d'enregistrement, située à droite.

SELECTION DE L'AFFICHAGE DE MENU (AVANT LA MISE A L'HEURE DE L'HORLOGE)

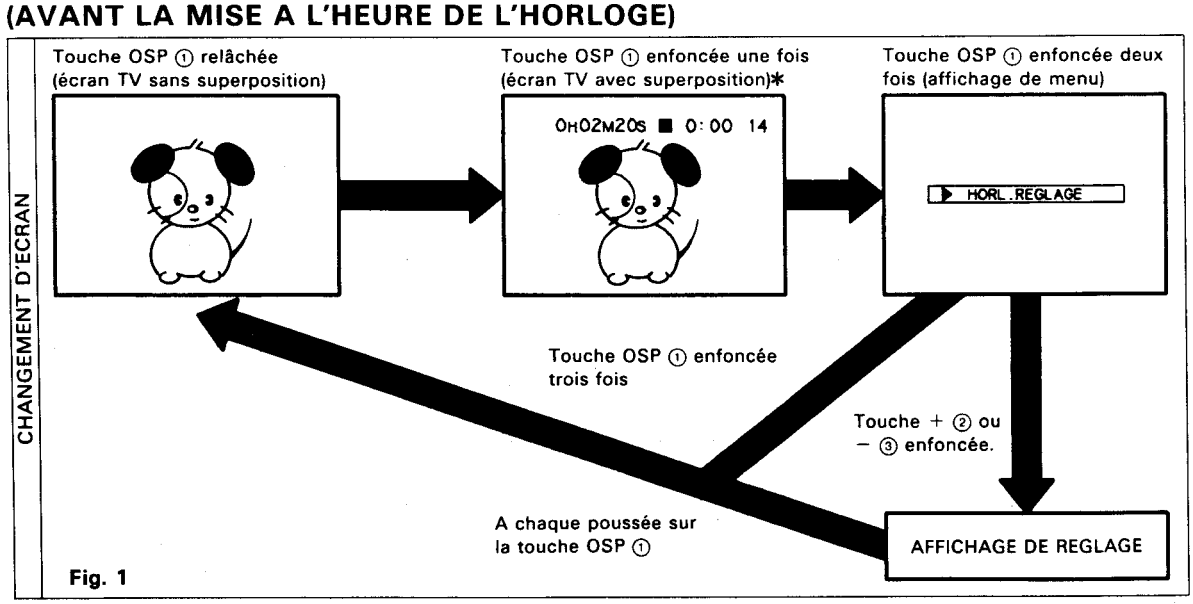


Fig. 1

* Pour l'affichage de superposition.

SELECTION DE L'AFFICHAGE DE MENU (APRES LA MISE A L'HEURE DE L'HORLOGE)

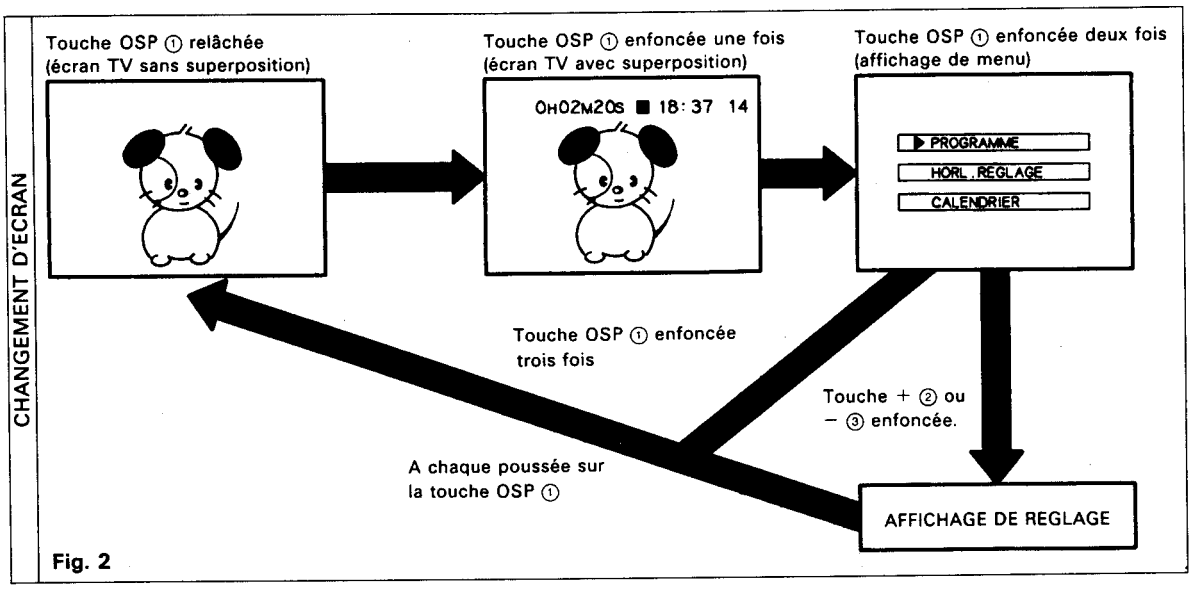


Fig. 2

Remarque: L'affichage de menu et l'affichage de réglage peuvent se commander en mode de réception télévisée.

A PROPOS DE L'AFFICHAGE DE SUPERPOSITION

L'écran de superposition présente les indications suivantes.

*0H 02M20S
Compteur de temps linéaire

■
Mode du transport de bande (voir tableau ci-dessous)

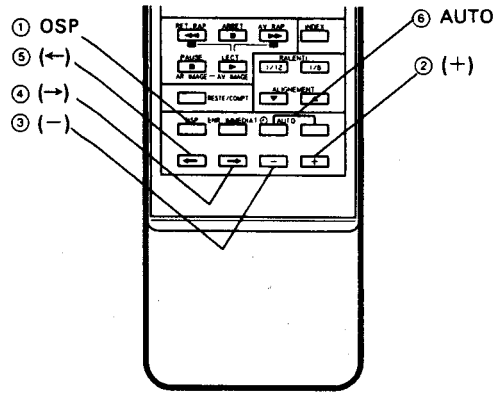
16:26
Heure réelle

4
Position de chaîne (uniquement en mode AVANCE RAPIDE, REBOBINAGE, ENR., PAUSE ET ARRET.)

Mode	IMAGE FIXE	RECHERCHE IMAGE AVANT	RECHERCHE IMAGE ARRIERE	RALENTI	ENREGISTREMENT	PAUSE
Indication	⏸	▶▶	◀◀	⏯	●	●⏸
Mode	LECTURE	ARRET	AVANCE RAPIDE	REBOBINAGE	AVANCE IMAGE PAR IMAGE	EJECTION
Indication	▶	■	▶▶	◀◀	⏸▶	⏏

*
1. Cette indication est changée avec "TR 2H00M" en mode de bande restante.
2. Les chiffres de l'affichage compteur sur l'écran peuvent être légèrement déformés. Ceci n'est pas une panne.

DEMARCHES D'EXPLOITATION

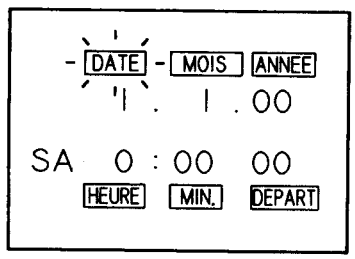


1. REGLAGE DE L'HEURE REELLE

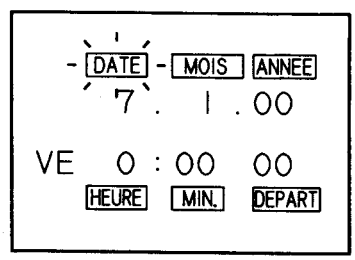
Choisir avant tout l'affichage de menu avec la touche OSP ① (voir Fig. 1).

Exemple: Pour régler sur "mercredi, 18:30, 7 juin 1989".

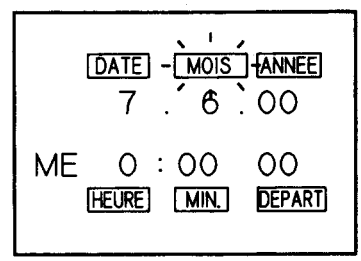
1. Appuyer sur la touche + ② ou − ③ pour entrer dans l'affichage de réglage de l'horloge.
   L'affichage de réglage de l'horloge apparaît.
   La position "DATE" clignote.



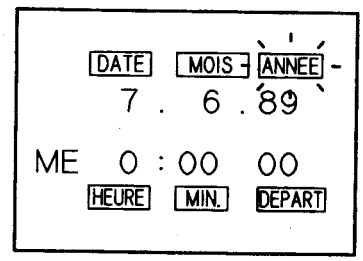
2. Poser le jour souhaité par la touche + ②. Le régler sur "7".



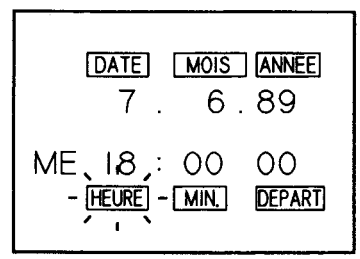
3. Déplacer la partie clignotante sur la position "MOIS" par la touche → ④. Poser le mois souhaité par la touche + ②. Le régler sur "6".



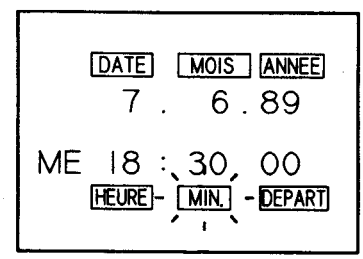
4. Déplacer la partie clignotante sur la position "ANNEE" par la touche → ④. Poser l'année souhaitée par la touche + ② ou − ③. Le régler sur "89".



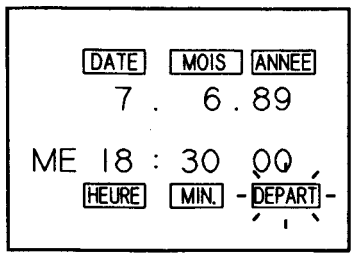
5. Déplacer la partie clignotante sur la position "HEURE" par la touche → ④. Poser les heures souhaitées par la touche + ②. Les régler sur "18".



6. Déplacer la partie clignotante sur la position "MIN." par la touche → ④. Poser les minutes souhaitées par la touche + ②. Les régler sur "30".



7. Déplacer la partie clignotante sur la position "DEPART" par la touche → ④. Pour lancer le fonctionnement de l'horloge du magnétoscope, appuyer sur la touche + ② ou − ③.



8. Pour sortir du mode OSP, appuyer sur la touche OSP ①.

Remarques

- Même si 60 minutes sont dépassées lorsque la touche + ou − est maintenue enfoncée, les indications des minutes retournent à "00" et les indications des heures restent inchangées.
- Si l'indication souhaitée est manquée, utiliser la touche − pour arriver à l'indication correcte des minutes.
- Une fois l'année, le mois et le jour sont selectionnés, le jour de la semaine sera automatiquement ajusté.
- Pour l'affichage de réglage de l'horloge, si des données incorrectes sont entrées (date impossible comme le 31 juin), il n'est pas possible de passer à l'étape de réglage suivant celle du réglage de l'année. Si, néanmoins, le réglage de l'horloge est poursuivi jusqu'à l'action sur la touche OSP, le message d'avertissement "CONFIRM. DATE" clignote en haut de l'écran.

  A propos de l'affichage de réglage d'horloge:
  L'affichage de réglage d'horloge change comme suit.

Réglage du jour:
→ 1 → 2 → 3 → 4 ····· → 31 →

Réglage du mois:
→ 1 → 2 → 3 → 4 ····· → 12 →

Réglage de l'année:
→ 00(2000) → 01(2001) ···· → 86(2086) ···· → 87(1987) ···· → 99(1999) →

Réglage des heures:
→ 0 → 1 → 2 → 3 ····· → 23 →

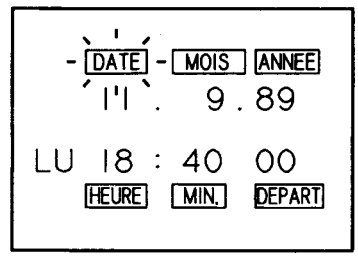
Réglage des minutes:
→ 0 → 1 → 2 ····· → 59 →

2. REMISE A L'HEURE DE L'HORLOGE

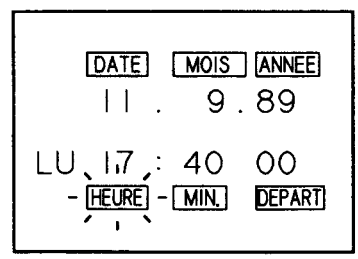
Exemple:

Jour courant: Lundi 11 septembre 1989 Heure: 18:40.
Si l'horloge doit être remise sur "17:50", procéder aux démarches suivantes.

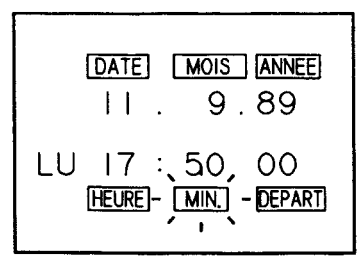
1. Choisir tout d'abord l'affichage de menu par la fonction OSP ① (voir Fig. 2).
2. Lorsque l'affichage de menu apparaît, déplacer le curseur (▶) sur la position "HORL. REGLAGE" par la touche → ④ ou ← ⑤.
3. Appuyer sur la touche + ② ou − ③ pour entrer en mode d'affichage de réglage de l'horloge.



4. Maintenir la touche → ④ enfoncée jusqu'à ce que la partie clignotante se déplace sur la position "HEURE". A présent, changer les chiffres des heures de "18" sur "17" par la touche − ③.



5. Maintenir de nouveau la touche → ④ enfoncée jusqu'à ce que la partie clignotante se déplace sur la position "MIN.". A présent, changer les chiffres des minutes de "40" sur "50" par la touche + ②.



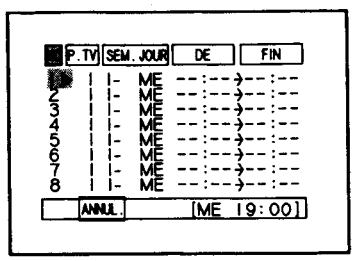
6. Déplacer la partie clignotante sur la position "DEPART". Pour lancer le fonctionnement de l'horloge du magnétoscope, appuyer sur la touche + ② ou − ③.
7. Appuyer sur la touche OSP ① pour sortir du mode OSP.

3. REGLAGE DES PROGRAMMES DE LA MINUTERIE

Avant tout, choisir l'affichage de menu par la touche OSP ① (voir Fig. 2).

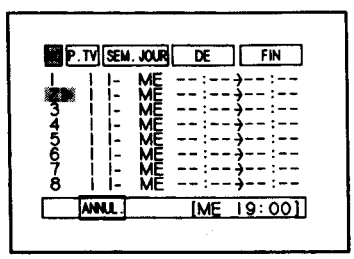
Exemple:
Date: mercredi 7 juin 1989, 19 heures
Le programme n°2, chaîne 26 est destiné à enregistrer, de 18h.10 à 19h. 30, le samedi de la deuxième semaine.

1. Vérifier l'affichage de l'horloge pour s'assurer de l'exactitude de la date et de l'heure. Si la date et l'heure ne sont pas exactes, les régler correctement (voir "2. REMISE A L'HEURE DE L'HORLOGE").
2. Lorsque l'affichage de menu apparaît, passer à l'affichage de réglage de programme de minuterie. Déplacer le curseur (▶) sur la position "PROGRAMME" de l'affichage de menu à l'aide de la touche → ④ ou ← ⑤. Ensuite, appuyer sur la touche + ② et − ③ pour entrer l'affichage de réglage de programme de minuterie. L'affichage ci-dessous apparaît.

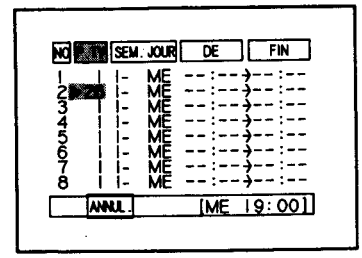


- Pour le réglage du numéro de programme (NO), le curseur se déplace vers le haut et le bas sur la ligne de commande du numéro de programme lorsque la touche + ② ou − ③ est actionnée.
- Dans les autres modes de réglage (réglage de position de canal, réglage de la semaine, réglage du jour, etc.), le curseur reste stationnaire et continue de clignoter à droite du numéro de programme dans lequel les données de programme pour la minuterie seront entrées après que l'opération d'entrée de données sont effectuées.

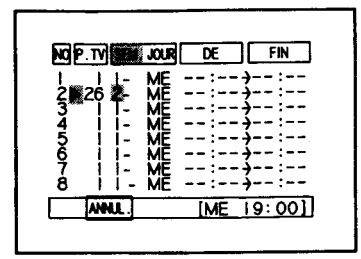
3. Si la position "NO" clignote.
   Déplacer le curseur (▶) sur la position "2" du programme avec la touche + ②.



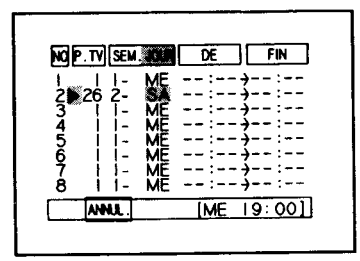
4. Déplacer la partie clignotante sur la position "P. TV" à l'aide de la touche → ④. Poser la chaîne souhaitée par la touche + ②. La régler sur "26".



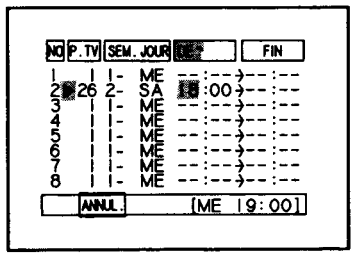
5. Déplacer la partie clignotante sur la position "SEM." à l'aide de la touche → ④. Poser la semaine souhaitée par la touche + ②. La régler sur "2 −".



6. Déplacer la partie clignotante sur la position "JOUR" à l'aide de la touche → ④. Poser le jour souhaité par la touche + ②. Le régler sur "SA".

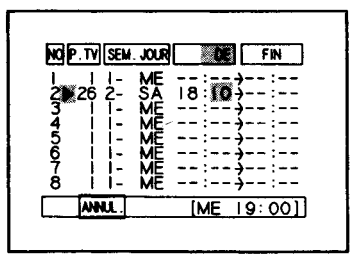


7. Déplacer la partie clignotante sur la position "DE " à l'aide de la touche → ④. Poser l'heure de la mise en marche souhaitée par la touche − ③. La régler sur "18".

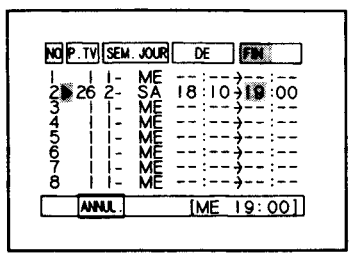


- Si la touche + ② ou − ③ est enfoncée une fois, l'heure réelle va apparaître sur la position de l'heure de mise en marche.

8. Déplacer la partie clignotante sur la position " DE" à l'aide de la touche → ④. Poser les minutes de la mise en marche souhaitées par la touche + ②. Les régler sur "10".

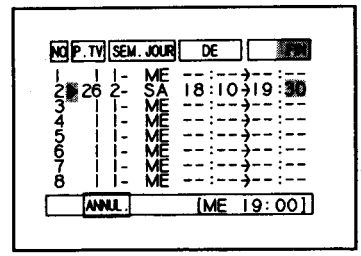


9. Déplacer la partie clignotante sur la position "FIN " à l'aide de la touche → ④. Poser l'heure de la mise à l'arrêt souhaitée par la touche + ②. La régler sur "19".

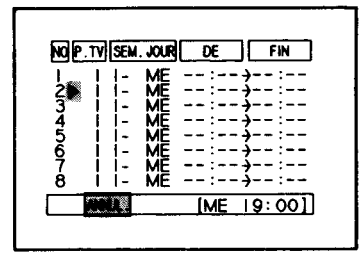


- Si la touche + ② ou − ③ est enfoncée une fois, l'heure de la mise en marche va apparaître sur la position de l'heure de la mise à l'arrêt.

10. Déplacer la partie clignotante sur la position " FIN" à l'aide de la touche → ④. Poser les minutes de la mise à l'arrêt souhaitées par la touche + ②. Les régler sur "30".



11. Lorsque la touche → ④ est enfoncée, la partie clignotante se déplace sur la position "ANNUL.". Si le réglage de programme de minuterie réglé doit être annulé, appuyer sur la touche + ② ou − ③. L'affichage suivant apparaît quand la touche + ② ou ③ est enfoncée.



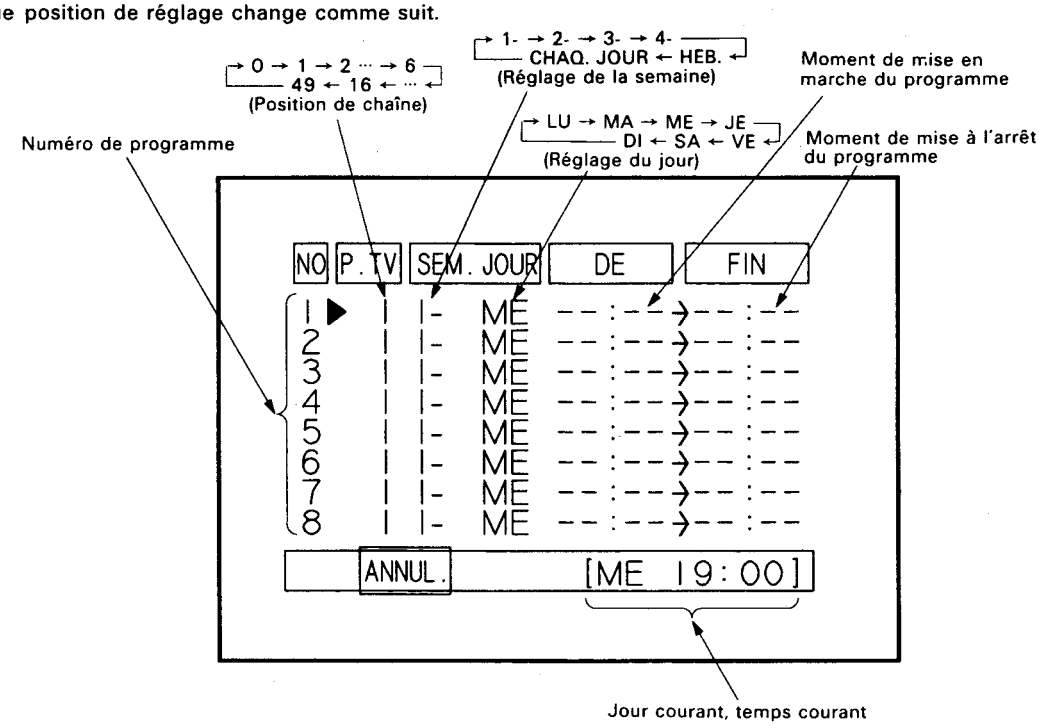
12. Si le réglage de programme de minuterie doit se poursuivre, déplacer la partie clignotante sur la position "NO" par la touche → ④ et répéter les étapes de 2 à 11. Un maximum de 8 programmes peut être réglé.

13. Lorsque le réglage des programmes est terminé, appuyer sur les touches AUTO ⑥.

Remarques:

- Dans le mode de réglage de programme de la minuterie, si la touche AUTO. est actionnée alors qu'aucune donnée de programme n'est entrée, le message d'avertissement CONFIRM. PROGRAMME clignote en bas de l'écran.
- Dans le mode de réglage de programme de la minuterie, si la touche AUTO. est actionnée alors qu'une cassette sans segment de sécurité est en place, le message d'avertissement "CONFIRM. CASSETTE" clignote en bas de l'écran et la cassette est automatiquement éjectée du compartiment à cassette.

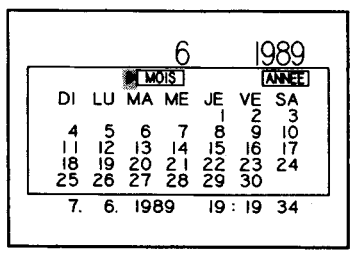
| Chaque position de réglage change comme suit.



Remarque: Sur la position SEM., le choix de l'option CHAQ. JOUR annule la démarche de réglage du jour de mise en marche.

4. APPARITION DE L'AFFICHAGE DU CALENDRIER SUR L'ECRAN

1. Avant tout, choisir l'affichage de menu par la touche OSP ① (voir Fig. 2).
   Après avoir appelé l'affichage de menu, déplacer le curseur (▶) sur la position "CALENDRIER" par la touche → ④ ou ← ⑤. Appuyer sur la touche + ② ou − ③ pour faire apparaître l'affichage du calendrier.



2. S'aider de la touche → ④ ou ← ⑤ pour choisir le mois et l'année à afficher sur l'écran.

   → [MOIS] → [ANNEE] →

3. Lorsque le curseur (▶) se trouve sur la position "MOIS", le fait d'appuyer sur la touche + ② fait changer l'indication du mois comme suit:

   → 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9 → 10 → 11 → 12 →

4. Lorsque le curseur (▶) se trouve sur la position "ANNEE", le fait d'appuyer sur la touche + ② fait changer l'indication de l'année comme suit:

   → 2000 → 2001 → 2002 ····· → 2085 → 2086 → 1987 → 1988 ····· → 1999 →

   - Pour l'affichage du calendrier, lorsque le nombre de mois dépasse 12, le chiffre des années est augmenté d'une unité. (Par exemple, si l'indication de l'année est 1989, lorsque le nombre de mois dépasse 12, l'année indiquée devient 1990.)

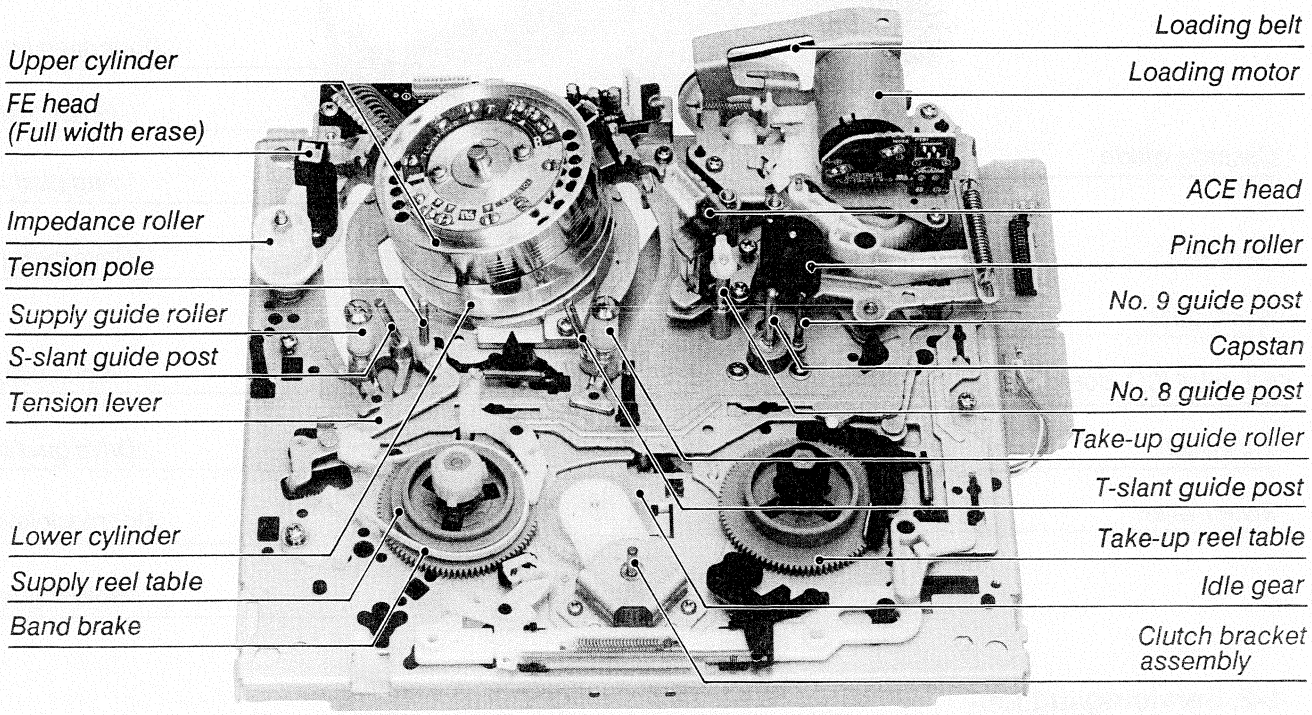
5. Appuyer sur la touche OSP ① pour relâcher le mode d'écran OSP.

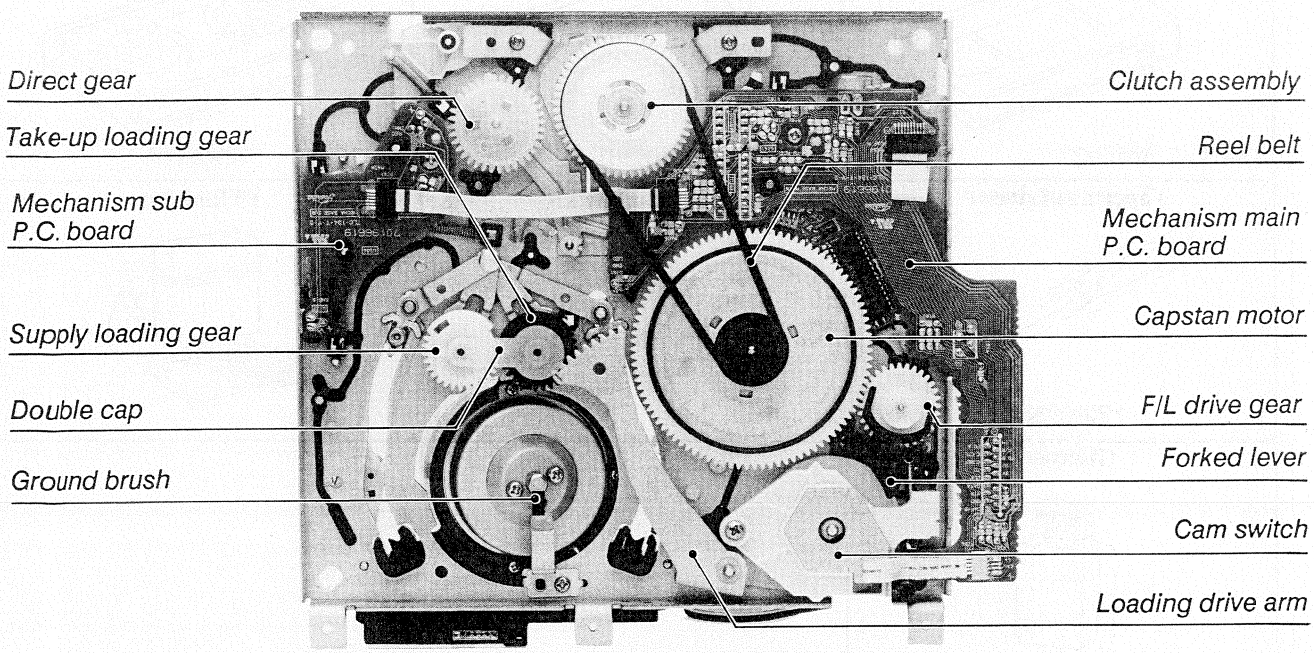
SECTION 2
ADJUSTMENT PROCEDURES

1. MECHANICAL ADJUSTMENT

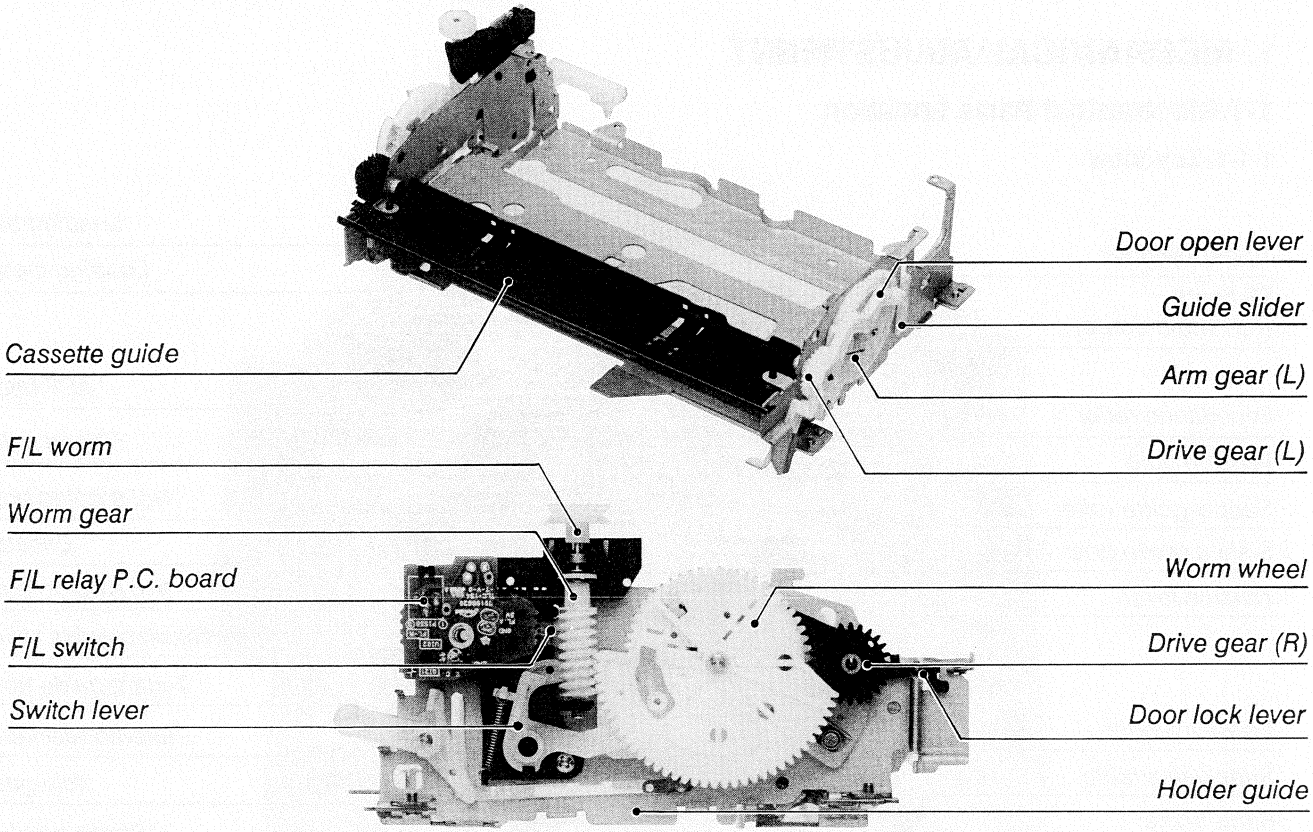
1-1. Mechanical Parts Location

1-1-1. Top View

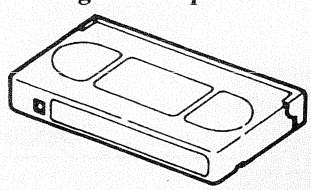
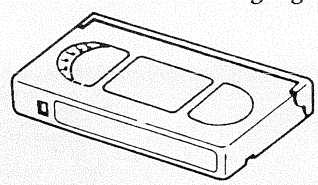
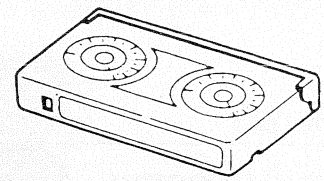
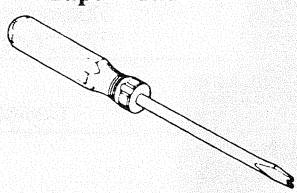
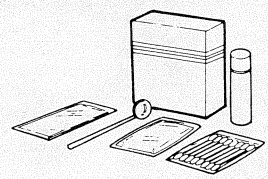
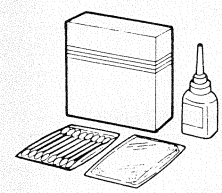




1-1-3. Front Loading Mechanism



1-2. Servicing Jig List

Alignment tape  ST-C1: 70909227	**Back tension cassette gauge**  70909103	**Torque cassette gauge (KT-300NR)**  70909199
Taper nut driver  70909228	**VTR cleaninig kit** 	**VTR oil kit** 
Grease 		

The alignment tape MH-2 (70909094) can be used instead of alignment tape ST-CI.

1-3. Main Parts Servicing Time

- Part replacement time differs from serving life time of each part.
- Following table is prepared based on a standard condition (room temperature, room humidity). The replacement time will be varied depending upon operation environment, using methods, operation duty, etc.
- Particularly, life of the upper cylinder depends upon operation conditions.

	Part Name	Servicing Time (Operating Hours)										Note
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape Transport System	Tension pole	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	• When cleaning, use a swab or a piece of gauze soaked in alcohol. • After the cleaning, cleaned parts are dried completely, and then load a video cassette. • When lubricating, always use the specified oil.
	S-slant guide post											
	S-guide roller											
	Impedance roller											
	No. 8 guide post											
	Capstan											
	No. 9 guide post											
	Guide roller											
	T-slant guide post											
	Upper cylinder	Δ	O	Δ	O	Δ	O	Δ	O	Δ	O	• When lubricating, apply one or two drops of oil after the cleaning with alcohol.
	FE head	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	O	
	ACE head	Δ	Δ	Δ	Δ	Δ	O	Δ	Δ	Δ	Δ	
	Pinch roller	Δ	Δ	Δ	Δ	Δ	O	Δ	Δ	Δ	Δ	
Tape Drive System	Capstan motor						O				O	
	Reel belt		Δ		O		Δ		O		Δ	
	Loading motor										O	
	Loading belt		Δ		O		Δ		O		Δ	
	Supply reel table				▲				▲		O	
	Take up reel table				▲				▲		O	
	Idle gear assembly		O		O		O		O		O	
Others	Band brake assembly		O		O		O		O		O	• Check the back tension.

Δ : Cleaning ▲ : Lubrication O : Check and replace if necessary

1-4. Main Parts Replacement

1-4-1. Front Loading Assembly Replacement

(1) Front loading assembly replacement

< Replacement >

1. Remove the top cover, front panel, and the bottom plate.
2. Remove the FL belt from rear bottom of the unit.
3. Disconnect the connector (A) from the F/L-R P.C. board.
4. Remove two screws (A).
5. Move the front loading assembly in direction shown by the arrow and remove it from the mechanism deck.
6. When remounting, use the above steps in reverse order.

Note:

When reinstalling the FL belt, take care the belt is not twisted.

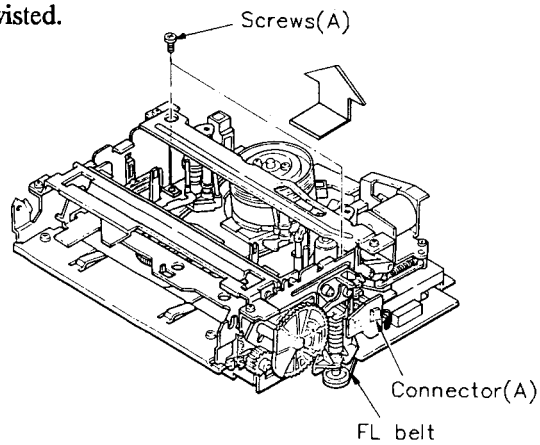


Fig. 4-1-1 Front loading assembly replacement

(2) F/L switch (SI22) and photo-transistor (QI21) replacement

1. Remove the screw (B) and the F/L-R P.C. board.
2. To remove the F/L switch and photo-transistor, unsolder the leads.
3. Replace them with new ones.

Note:

When reinstalling the F/L-R P.C. board, take care the F/L switch is not damaged.

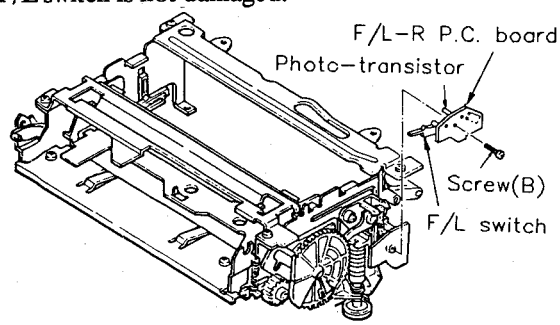


Fig. 4-1-2 F/L switch and photo transistor replacement

(3) Guide slider (K317) replacement

1. Turn the FL worm gear with your hand until the cassette holder is set to the cassette in condition.
2. Move the holder guide L outward and remove the guide slider from the cassette holder. Then, remove the guide slider from the holder guide L.
3. When remounting, use above steps in reverse order.
4. Turn the FL worm gear with your hand and set the cassette holder to the cassette out condition.

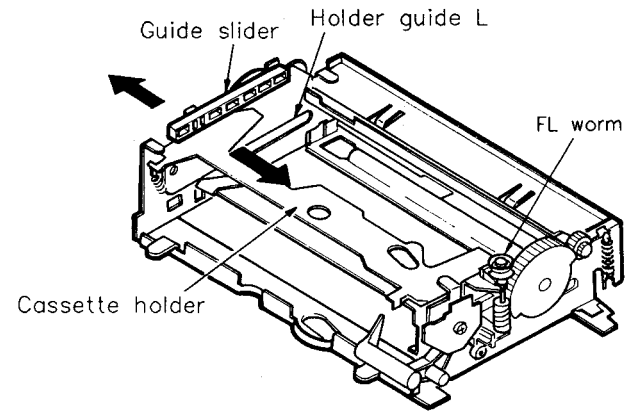


Fig. 4-1-3 Guide slider replacement

(4) Replacement of other parts

1. Do not replace the components not authorized. (Refer to the Parts List.)
   If replaced, accuracy of the front loading assembly will decrease and smooth operation may be not obtained.
2. When replacing the arm gear and the drive gear, take care on the following points:
   a: Position the arm gear and the drive gear so that their alignment marks match with the arm gear facing almost upward as shown in the illustration, and then mount them. This is true for both the left and right sides.
   b: If the alignment marks are not matched, the front loading may not operate smoothly.

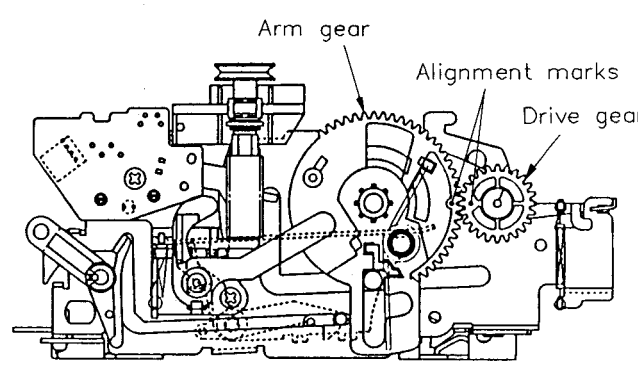


Fig. 4-1-4

1-4-2. Cylinder

(1) Upper cylinder assembly

< Inspection >

1. Check if video heads are damaged or worn out.
2. Check video heads for clogging.
   (Replace the upper cylinder assembly if the clogging is not remedied after cleaning.)

< Replacement >

1. Unsolder the relay terminals on the head relay P.C. board. The solder will be removed easily using a desoldering wire (Fig. 4-2-1, 4-2-2).
2. Remove two screws and remove the upper cylinder assembly.
3. Clean the new upper cylinder assembly and the surface of the flange before mounting, using a cleaning kit.
4. Align phases of the white part of Head relay P.C. board and Rotary transformer (A) P.C. board and then mount the upper cylinder.
   (Tightening torque; 3 – 4kg-cm.)
5. Perform the tape transport adjustment.

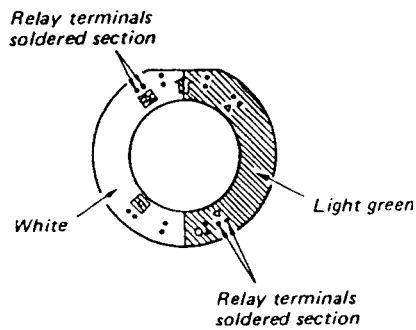


Fig. 4-2-1 Head relay P.C. board

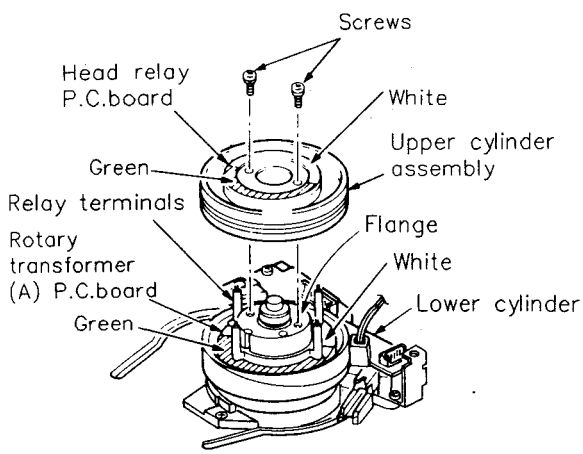


Fig. 4-2-2 Upper cylinder replacement

(2) Cylinder motor

< Inspection >

1. Apply power to the cylinder motor separately.
2. If the motor does not rotate, replace the cylinder motor (rotor and stator).

< Rotor replacement >

1. Remove the ground cap.
2. Remove two rotor screws and replace the rotor.
   (Tightening torque; 3 – 4kg-cm.)

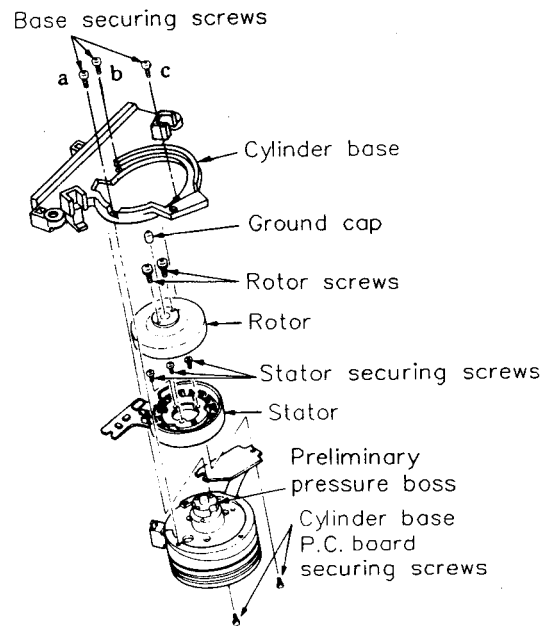


Fig. 4-2-3 Cylinder motor replacement

Note:

When mounting a new rotor, position the rotor so that its phase matching holes match those of the preliminary pressure boss. (Fig. 4-2-4)

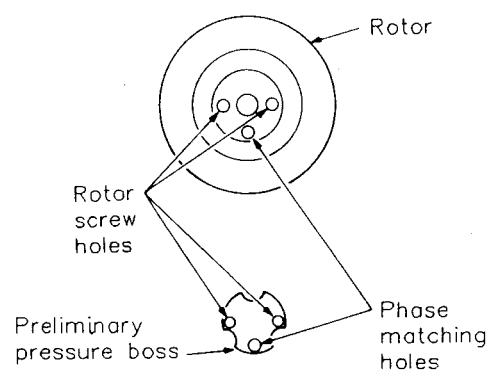


Fig. 4-2-4 Phase matching between rotor and preliminary pressure boss

< Stator replacement >

1. Remove the cylinder assembly. (Refer to the cylinder replacement procedures.)
2. Remove the cylinder base P.C. board securing screw (Fig. 4-2-5).

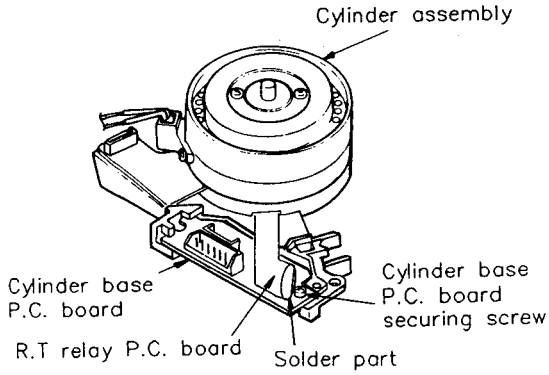


Fig. 4-2-5 Relay P.C. board and cylinder base P.C. board

Note:
In this case, take care not to damage patterns of the R.T relay P.C. board.
Also handle the cylinder base P.C. board carefully so that the cylinder is not damaged by the cylinder base P.C. board.

3. Remove three base securing screws and remove the cylinder base. (Fig. 4-2-3)
4. Remove the ground cap.
5. Remove the rotor screws and the rotor. (Fig. 4-2-3)
6. Remove the stator securing screws.
7. Pull out the stator and replace it. (Tightening torque 1.5 – 2.5 kg-cm)
8. Replace the rotor. (Tightening torque 3 – 4 kg-cm) (Fig. 4-2-3)
9. When mounting the cylinder assembly, perform the previous steps in reverse order.

Note:
Sequence of tightening base securing screws: tighten screw a first, b and c in any order.
(Tightening torque is 3 – 4 kg-cm.)
(Fig. 4-2-3)

10. Perform the tape transport adjustment.

(3) Cylinder assembly

< Inspection >

1. Check to see that rotating surface of the lower cylinder has no damage such as scratches, cracks, etc.
2. Check to see smooth rotation of the upper cylinder. If abnormality is found, replace the cylinder(s).

< Replacement >

1. Remove two preamplifier securing screws and remove the preamplifier.
2. Remove three screws (A).
3. Remove the cylinder motor connector.
4. Remove the cylinder assembly.

Note:
When removing the cylinder assembly, move the impedance roller in direction shown by the arrow.

4. Align position of a new cylinder to the cylinder base, taking care not to touch the video heads directly and not to damage the cylinder surface.
   When mounting the cylinder assembly, perform the previous steps in reverse order.
   Do not forget the preamplifier mounting bracket is to be tightened with the cylinder assembly.
5. Perform the tape transport adjustment.

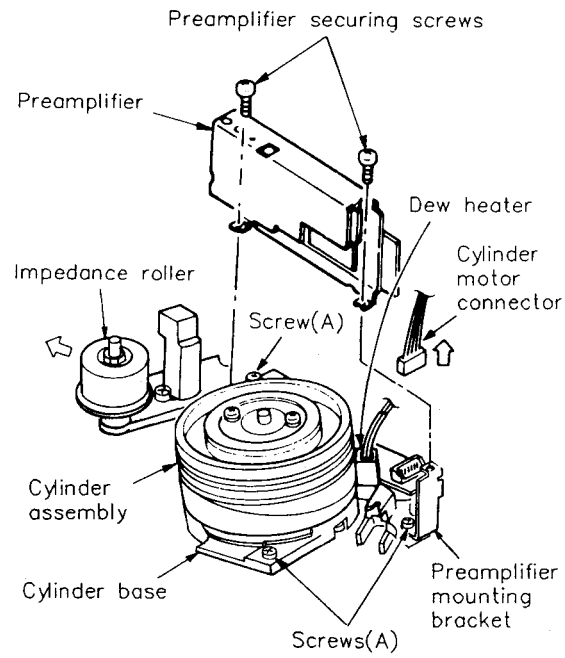


Fig. 4-2-6 Cylinder assembly replacement

1-4-3. Transport System Parts Replacement

(1) ACE head assembly replacement

1. Disconnect the connector from the ACE P.C. board.
2. Remove the taper nut.
3. Remove the pinch lock spring and pinch connector so that they do not give trouble when removing the pinch roller from the ACE head.
4. Turn the ACE height adjusting nut counterclockwise and remove the nut in order to remove ACE base assembly. (Fig. 4-3-1)

Note:

Note positions of the ACE base and the taper nut.

4. Remove the E-ring and the ACE azimuth adjusting screw in order to remove the ACE head assembly.
5. Remove the ACE P.C. board from the ACE head assembly.
6. Replace the ACE head assembly, according to the reverse procedures.
7. Mount the taper nut, pinch lock spring and pinch connector.
8. Rotate the ACE height adjusting nut until the ACE base and the upper position of the taper nut have the same position as they were removed.
9 After mounting, perform the tape transport adjustment, starting from the first step.

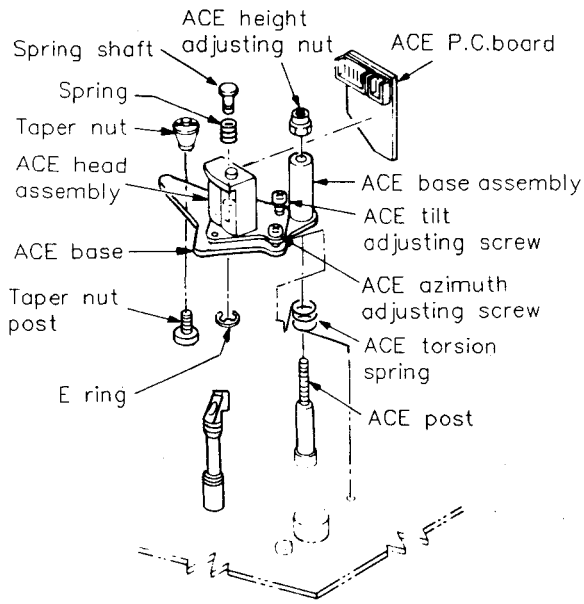


Fig. 4-3-1 Replacement of ACE head assembly

Note:

- Since direct mounting of the ACE torsion spring is difficult, first insert the tip of the spring into the hole on the main base and then hook the opposite tip of the spring to the ACE base which has been inserted into the ACE post.
- When replacing the ACE head assembly, always use an ACE head having the same part number. Do not use any other ACE head assembly.

(2) No. 8 guide sleeve replacement

1. Remove No. 8 cap and No. 8 guide sleeve in this sequence as shown in Fig. 4-3-2. When reassembling, perform the previous steps in reverse order.
2. To mount the No. 8 guide sleeve, insert the No. 8 cap onto the No. 8 post and push the cap downward while turning the cap left and right.

Note:

- No. 8 guide sleeve functions as the reference for tape transport, so the replacement should be made carefully.
- When mounting the No. 8 guide cap, mount the cap with its slant surface facing to cassette side.
- The guide sleeve has a directional characteristic, so take care when inserting it. Do not insert the sleeve upside-down. The lower flange thickness is higher than the upper flange thickness by about 1.6mm.

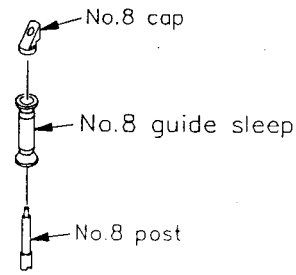


Fig. 4-3-2 No. 8 guide replacement

(3) FE head replacement

1. Disconnect the 2P connector of the FE head.
2. Remove the FE head mounting screw and the FE head can be removed. (Fig. 4-3-3)
3. Replace the new FE head and tighten the FE head mounting screw.
4. Connect the 2P connector.
5. Confirm whether the associated adjustments is not upset, starting check from the linearity adjustment, item 4) of the tape transport adjustment. (Refer to item 1-5-4 (3).)

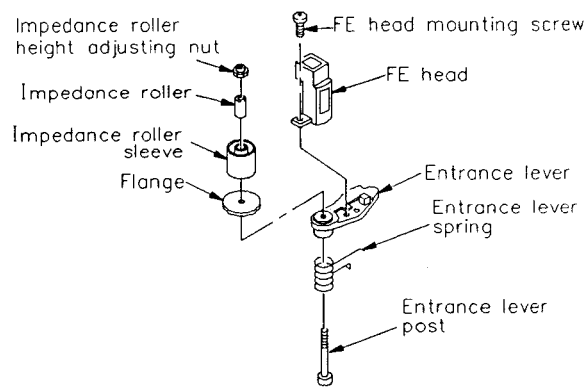


Fig. 4-3-3 Replacement of No. 3 guide and FE head

(4) Impedance roller replacement

1. Remove the impedance roller height adjusting nut and replace the impedance roller as shown in Fig. 4-3-3. Before removing the nut, note the number of threads or height exceeding the surface of the nut.
2. When mounting a new impedance roller, use the reverse procedures.
3. After replacement of the impedance roller, perform the adjustment from the linearity adjustment, item 4) in the tape transport adjustment. (Refer to item 1-5-4 (3).)

(5) S, T-guide rollers replacement

The same replacement procedures will be applied for both S and T-guide rollers.

1. Loosen the set screw shown in Fig. 4-3-4.
2. Turn the guide roller counterclockwise and remove it.
3. As the O-ring may stick to the guide roller when removed, remove the O-ring and install it on the new guide roller.
4. When remounting, perform the previous steps in reverse order.
5. After completion of the replacement, perform adjustment from the linearity adjustment item 4) in the tape transport adjustment. (Refer to item 1-4-5 (3).)

Note:

When tightening the set screw, temporarily tighten it with light pressure. If it is tightened too hard, associated adjustments can not be made.
The S-guide roller has a no mark on the upper flange and the T-guide roller has a black mark on upper flange. Do not exchange them when remounting.

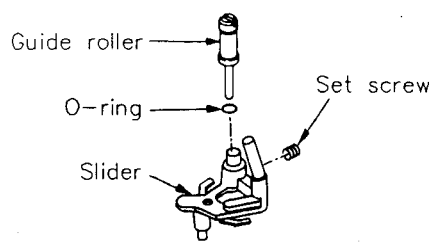


Fig. 4-3-4 Guide roller replacement

(6) S, T-sliders replacement

1. Remove the cylinder assembly.
2. Place the VTR vertically and remove the bottom cover.

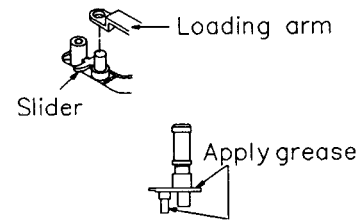


Fig. 4-3-5 S, T-slider replacement

3. Move the slider up to the loading position by turning the loading motor with your hand.
4. Remove the loading arm as shown in Fig. 4-3-5.
5. Remove the guide roller and reinstall it in a new slider according to the steps stated in (5).
6. When replacing the slider, perform the previous steps in reverse order.
7. After completion of the replacement, perform the rough adjustment in the tape transport system adjustment. (Refer to item 1-5-4 (3)).

Note:

When the slider is replaced, always apply grease to the slider receptacle as shown in Fig. 4-3-5.

(7) No. 9 guide lever assembly replacement

1. Remove the front loading assembly.
2. Remove the pinch lever assembly.
3. Remove the cam lever assembly.
4. Remove the loading drive assembly.
5. Remove the ACE head assembly.
6. Remove the nut and replace the No. 9 guide lever. In this case, note the number of threads exceeding the surface of the nut.
7. Reassemble the parts removed, using the reverse procedures.
   (Tighten the nut until the same thread number appears.)
8. After completion of the replacement, perform the adjustment from item 6) in the tape transport adjustment. (Refer to time 1-5-4 (3).)

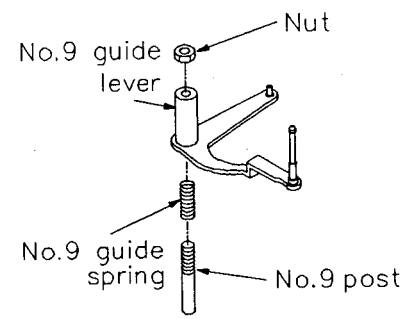


Fig. 4-3-6 No 9 guide lever replacement

1-4-4. Pinch Roller Assembly Replacement

1. Remove the pinch lock spring and disconnect the pinch connector.
2. Remove the stop ring and remove the pinch roller assembly upward.
3. Clean the pinch post and apply grease on it.
4. Replace the pinch roller assembly according to the previous steps in reverse order.
5. After replacement, make sure the T-sub brake is in touch with the T-reel table with a proper pressure.
6. After completion of the replacement, perform adjustment from item "1-5-4 (3) Tape transport system adjustment".

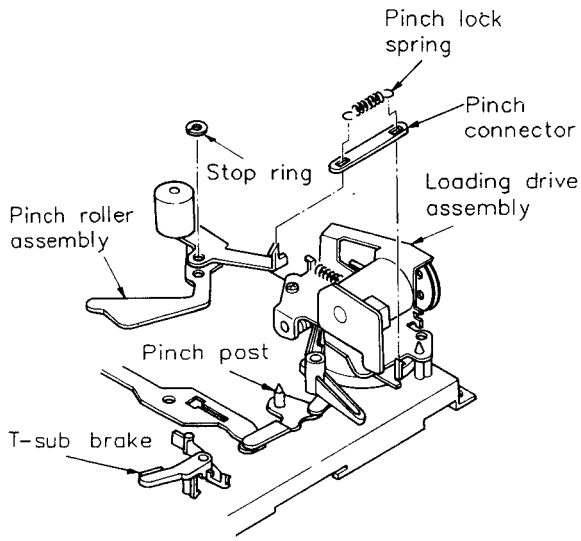


Fig. 4-4-1 Pinch roller replacement

1-4-5. Loading Motor Replacement

1. Remove the motor P.C. board from the loading motor, taking care not to damage the wire harness.
2. Remove the pinch lock spring and disconnect the pinch connector.
3. Off-hook the claw hooked on the main base, using a screw driver and remove the cam lever upward.
4. Remove the screws (A) and remove the loading drive assembly.
5. Remove the loading belt and screws (B), and remove the motor.
6. When replacing the motor with a new one, perform the previous steps in the reverse order, taking care of the polarities (+) polarity should be located on the bottom leftside. In this case, also mount the dew sensor with the motor, using the screws (B). Do not touch the surface of the sensor.

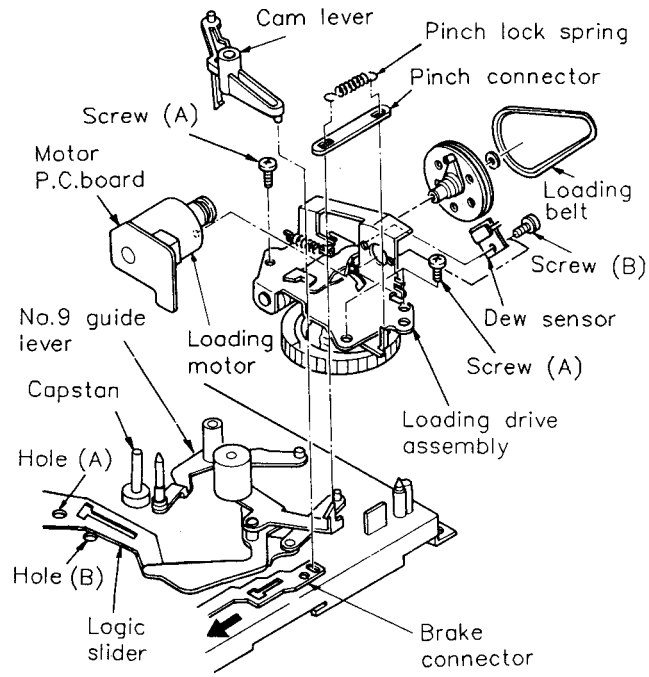


Fig. 4-5-1 Loading motor replacement

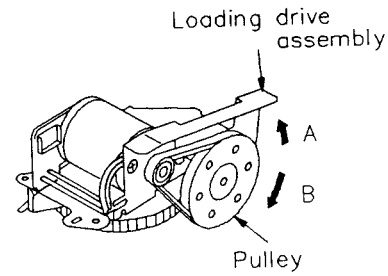


Fig. 4-5-2 Loading drive mounting mode

7. Turn the pulley of the loading drive assembly counterclockwise (as arrow A) until it stops, and then rotate it 3 turns clockwise (as arrow B) to set the mounting mode.
8. Before mounting the loading drive assembly on the main base, position the logic slider so that its hole matches the phase matching hole (A), and then move the No. 9 guide lever until it touches the capstan.
   As the phase matching hole (A) exists near the hole (B) (1.2cm right from hole (A)), do not mistake hole (B) for hole (A).
9. Slide the brake connector in the direction shown by the arrow, and mount the cam lever.
10. Mount the pinch connector and the pinch lock spring.

1-4-6. Tension Regulator Assembly

1. Remove the tape tension spring from the tension regulator assembly.
2. Remove the screw and remove the tension regulator assembly from the main base while releasing the S-soft brake lever.
3. Clean the shaft of the new tension regulator and then apply one or two drops of oil. When replacing the tension regulator, perform the previous steps in reverse order.
4. After completion of the replacement, check position of the tension pole and its adjustment (refer to item 1-5-2) and check the back tension (refer to item 1-5-3).

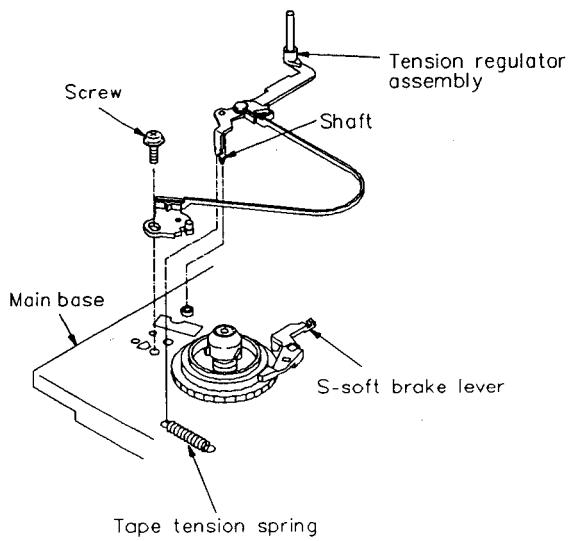


Fig. 4-6-1 Tension regulator assembly replacement

1-4-7. Cam Switch Replacement

1. Remove the screw and the cam switch assembly.
2. Apply grease to the boss section (lower than the cutout D) of the loading cam.
3. Position the cam switch assembly so that the hole (D) on the cam switch matches the cutout D on the loading cam, and then mount the cam switch with the screw.

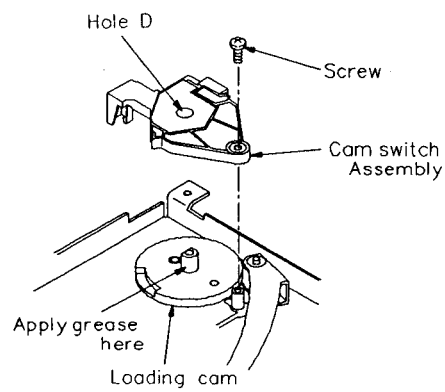


Fig. 4-7-1 Cam switch assembly replacement

1-4-8. T, S-Sensor Assemblies Replacement

1. Remove the mechanism main or sub P.C. board.
2. Desolder four sensor leads.
3. Unhook the holder claws from the P.C. board.
4. When reinstalling a new sensor, perform the previous steps in the reverse order.

Note:
Since the Hall element is glued on the sensor holder, take care the hall element is not torn off during installation.

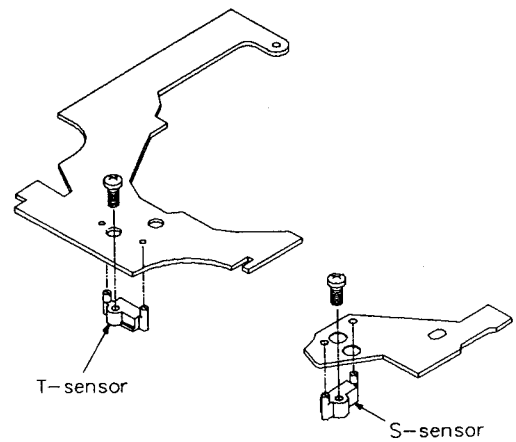


Fig. 4-8-1 Sensor assemblies replacement

1-4-9. Main Brake Assembly Replacement

1. The brake assembly has the mold claws which allow one touch installation or removal.

Note:
When replacing, take care not to touch the brake pad surface.

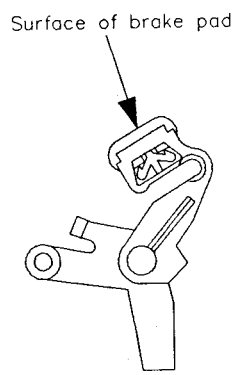


Fig. 4-9-1 Main brake assembly replacement

1-4-10. Ground Brush Replacement

1. Remove the screw and the brush.
2. Clean the ground cap using alcohol.
3. Replace the brush.
   Mount a new brush so that it can contact the center of the ground cap.

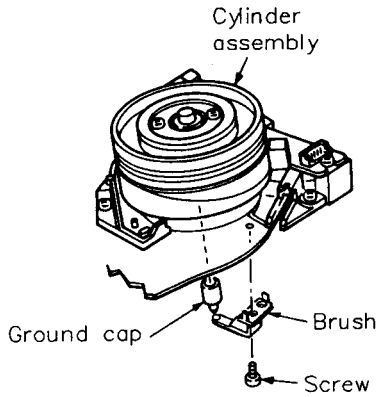


Fig. 4-10-1 Brush replacement

1-4-11. Reel Table Replacement

(1) Supply reel table assembly

1. Remove the tape tension spring from the tension regulator assembly. (Also remove the mechanism sub P.C. board.)
2. Remove the screw and remove the tension regulator assembly.
3. Remove the S-reel table assembly upward paying attention not to miss the washer while releasing the S-soft brake lever in the direction shown by the arrow.
4. After cleaning the reel shaft with a cleaning kit, lubricate it with one or two drops of oil.
5. When reinstalling the S-reel table assembly to the deck, make sure the washer is replaced on the reel shaft.

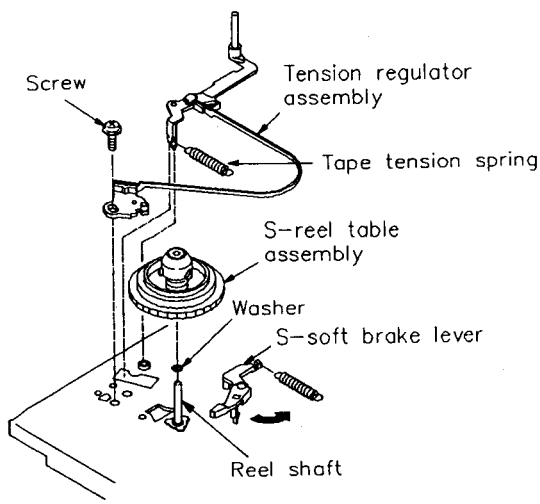


Fig. 4-11-1 Supply reel table assembly replacement

6. Mount the tension regulator assembly.
7. Hook the tape tension spring onto the tension regulator assembly.

Note:
In this case, take care not to give permanent deformation to the spring.

(2) Take-up reel table assembly

1. Remove the pinch lock spring.
2. Remove the pinch connector.
3. Remove the pinch roller assembly.
4. Remove the reverse brake spring from the reverse brake assembly.
5. Remove the reverse brake assembly from the main base. In this case, move the reverse brake in the direction shown by the arrow to remove the brake assembly at a larger hole of the main base.
6. Remove the T-reel assembly.
7. As the bearing is stained with oil, the washer may stick to the T-reel table assembly and be removed with it. Take care not to miss them.
8. Clean the reel shaft using a cleaning kit, and apply one or two drops of oil after the reel shaft has dried.
9. Replace the take-up reel with a new one.

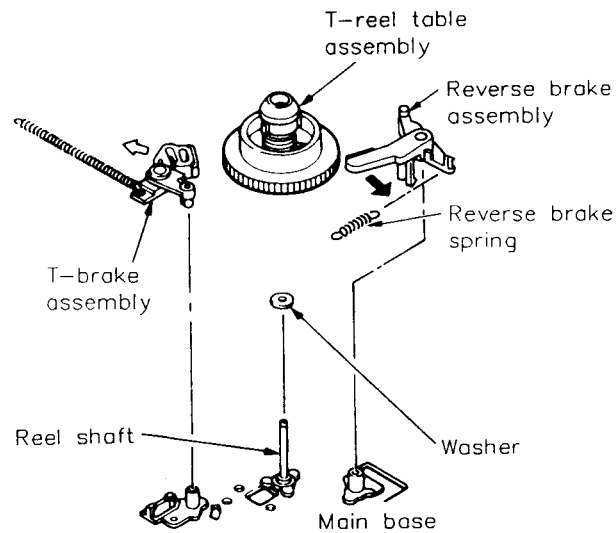


Fig. 4-11-2 Take-up reel table assembly replacement

1-4-12. Direct Gear Assembly Replacement

1. Turn the deck upside-down and remove the reel belt.
2. Remove the flat cable (FFC) and the main relay P.C. board. (Refer to item 1-4-15 (1).)
3. Remove the gear lever spring.
4. Remove the stop ring (1) and remove the gear lever upward.
5. Remove the stop ring (2), and remove the direct gear assembly from the gear lever, taking care not to miss the washers.

6. Clean the gear post, using the cleaning kit. Apply one or two drops of oil.
7. When replacing the direct gear assembly and mounting the gear lever, make sure the washers are replaced on the gear post.
8. Apply grease to the lever post and then mount it in the reverse order.

Note:

- When inserting the stop ring (2), hold the under side of the gear post.
- When installing the gear lever spring, take care of the direction of the hook.
- Take care that the gear lever spring is not positioned over the release lever.
- Take care that the gear lever spring is not positioned over the drive base stopper.

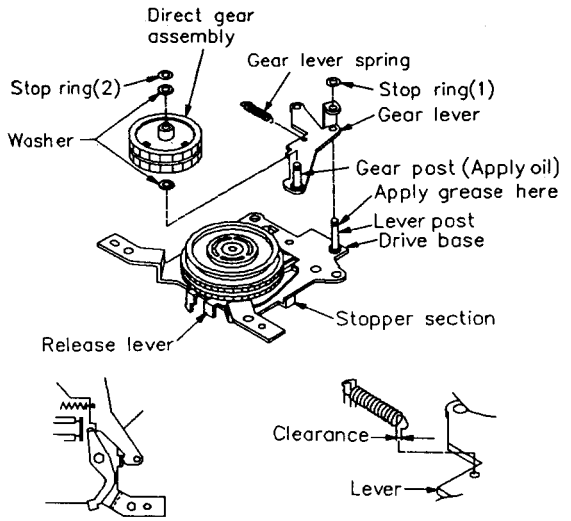


Fig. 4-12-1 Direct gear assembly replacement

1-4-13. Clutch Assembly Replacement

1. Turn the deck upside-down and remove the reel belt.
2. Remove the stop ring, and remove the clutch assembly upward. Take care not to miss the washers.
3. Clean the clutch post using the cleaning kit, and then apply one or two drops of oil.

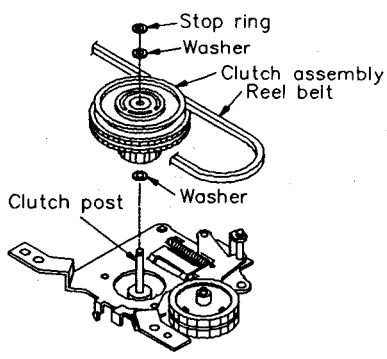


Fig. 4-13-1 Clutch assembly replacement

4. When replacing the clutch assembly and mounting it on the deck, make sure the washers are replaced on the clutch post.
5. When remounting, use the reverse procedures. (When mounting the belt, take care that the belt is not twisted.)
6. Check the reel torque, using the torque cassette.

1-4-14. Idle Gear Assembly Replacement

1. Turn the deck upside-down.
2. Remove the clutch as stated in item "1-4-13. Clutch Assembly Replacement".
3. Remove the direct gear assembly from the gear lever as stated in item "1-4-12. Direct Gear Assembly Replacement".
4. Place the deck in normal position.
5. Remove two screws.
6. Replace the idle gear assembly with a new one, using the reverse procedures. In this case, assemble the idle gear assembly with the shaft space (between the clutch post and gear post) set as $33.2^{+0.1}_{-0.05}$ mm. (When mounting the belt, take care that the belt is not twisted.)
7. Check the reel torque, using the torque cassette.

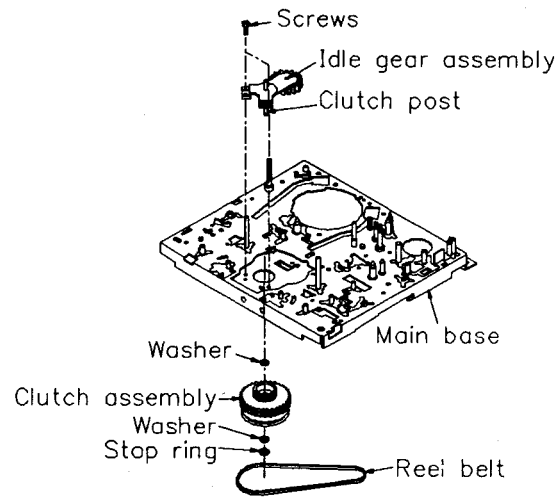


Fig. 4-14-1 Idle gear assembly replacement

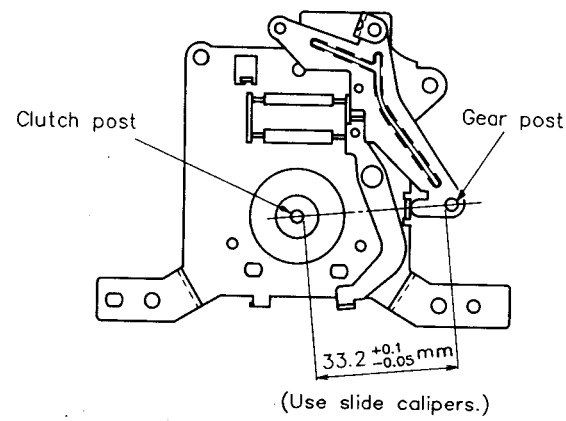


Fig. 4-14-2

1-4-15. Mechanism Relay P.C. Board Replacement

(1) Mechanism main P.C. board replacement

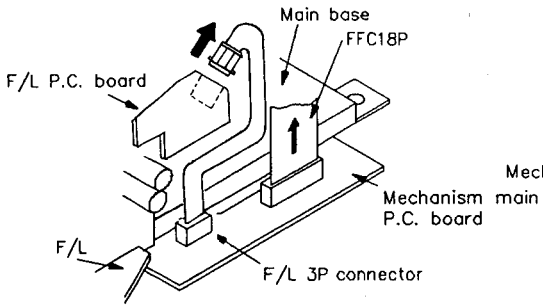


Fig. 4-15-1 Main P.C. board replacement

1. Pull and disconnect the FFC18P connector in direction shown by the arrow from the mechanism main P.C. board. Next disconnect FL3P connector from the F/L P.C. board of by pulling it in direction shown by the arrow.
2. Disconnect FFC5P from the mechanism assembly, rear side by pulling it in direction shown by the arrow. Next, remove the F/L belt and the reel belt. (Fig. 4-15-3)

Note:
The F/L belt and the reel belt are different in their length, so paying attention when replacing them.

3. When disconnecting the FFC6P and the FFC10P, refer to the disconnecting method shown in Fig. 4-15-2.

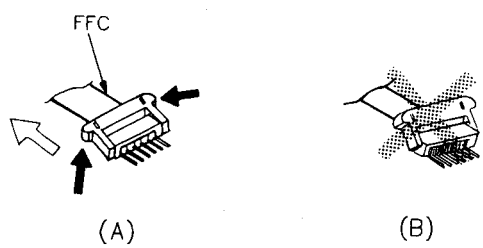


Fig. 4-15-2

< How to disconnect the flat cable from the FFC connector locked >
Hold the protruded parts (shown by the black arrows) of the connector and pull the connector in the direction shown by the white arrow to release the lock. Then, pull the FCC (flat cable) and the cable will be removed.

Don't pull the connector as shown in Fig. 4-15-2 (B). If pulled strongly in the direction to be opened, the cable will be damaged.
When connecting, insert the cable with the metal terminal side facing down and then use previous steps in reverse order.

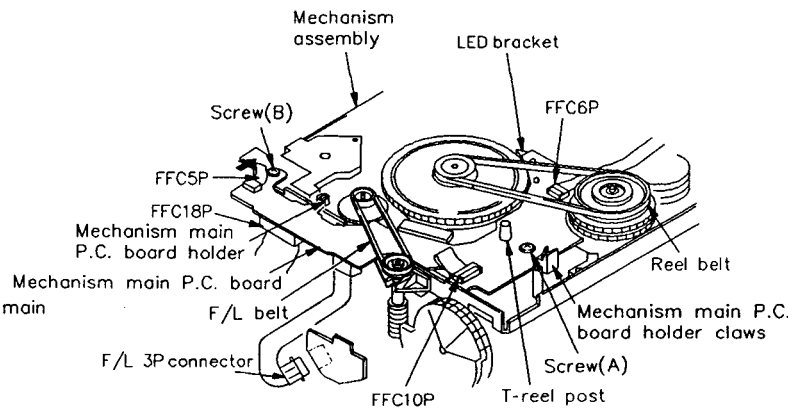


Fig. 4-15-3

4. Remove screw (A) and screw (B).
(Since the screws are different each other, paying attention when replacing them.)
5. Press and bend claws of the LED bracket in direction shown by the black arrows on upper side of the mechanism assembly, and then push them in direction shown by the white arrow so that they can pass the hole (Fig. 4-15-4).

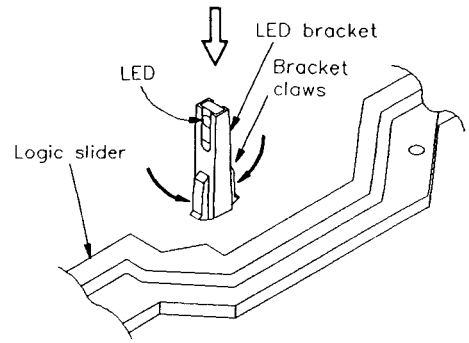


Fig. 4-15-4

6. Unhook the mechanism main P.C. board from the mechanism main P.C. board holding claws on the front mechanism assembly and lift the mechanism main P.C. board slightly. (Fig. 4-15-5 and 4-15-6)
7. Turn the mechanism main P.C. board in the direction shown by the shaded arrow as shown in Fig. 4-15-5, and remove the P.C. board from the mechanism main P.C. board holder section. In this case, the P.C. board will close to the F/L worm bracket, so slightly lift the P.C. board so that the P.C. board does not touch the worm bracket. Also take care not to damage the main P.C. board holder. Finally, remove the mechanism main P.C. board, paying attention not to touch the reel post.

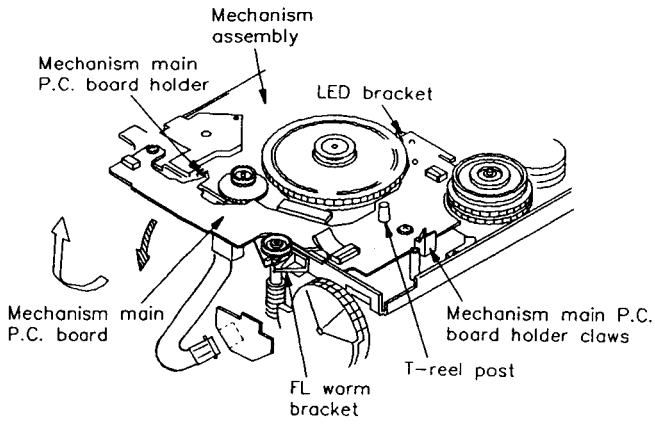


Fig. 4-15-5

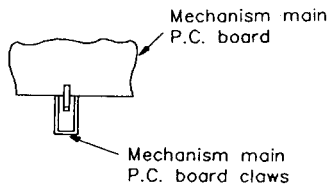


Fig. 4-15-6

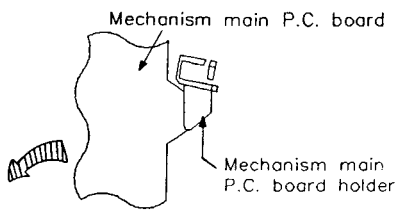


Fig. 4-15-7

Note:
When removing or remounting, take care that the LED is not contaminated by grease or damaged by scratches. (Fig. 4-15-4)

8. When mounting, insert the LED section onto the LED bracket hole so that the claws of the LED bracket do not engage the main base completely (Fig. 4-15-8). Next, mount the P.C. board on the T-reel post and the mechanism main P.C. board holder section securely, using the previous steps in reverse order. In this case, take care that FFC5P, FFC6P, and FFC10P are not jammed between the parts.
9. Hereafter, mount the parts in reverse procedures. In this case, route the FFC6P as shown in Fig. 4-15-9.

Note:
Take care the reel belt does not touch the flat cables, etc.
Also take care the reel belt and the F/L belt are not twisted when they are installed.

10. After the replacement, make sure all parts such as connectors, belts, etc. are mounted without missing any parts. Improper connection or installation, etc. may cause erroneous operation.

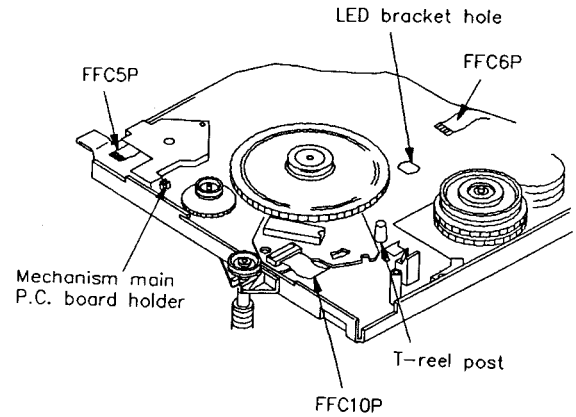


Fig. 4-15-8

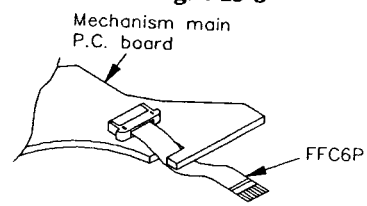


Fig. 4-15-9

(2) Mechanism sub P.C. board replacement

1. Disconnect the flat cable (which connects the main and the sub P.C. board) from the connector on the sub P.C. board.
2. Remove the screw.
3. Remove the sub P.C. board while opening the claws securing the sub P.C. board. In this case, take care not to damage the lens of the end sensor mounted on rear of the sub P.C. board.
4. When mounting, use the reverse procedures. Mount the sub P.C. board while turning the erase prevention lever in the direction shown by the arrow.

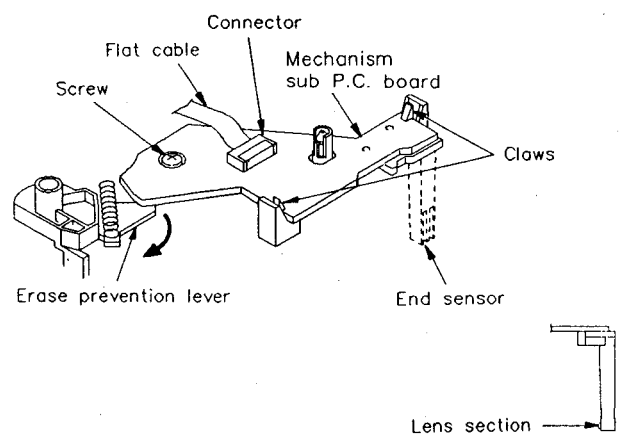


Fig. 4-15-10

1-4-16. Capstan Motor Replacement

1. Turn the deck upside-down.
   Remove the F/L belt, reel belt, FFC (3) for cam switch, FFC (4) for mechanism sub P.C. board, and FFC (5) for capstan motor.

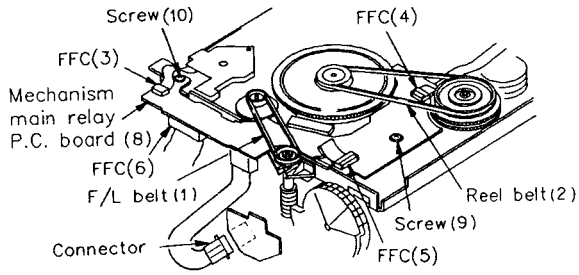


Fig. 4-16-1

2. Replace the deck in normal position.
   Remove the FFC (6) for unit main P.C. board, and then disconnect the connector extending from the mechanism main relay P.C. board to the F/L.
3. Remove screws (9) and (10) from the rear of the deck, and remove the mechanism main relay P.C. board. (For more details, refer to item "1-4-15. Mechanism Relay P.C. Board Replacement". (Screws (9) and (10) are not the same, so do not exchange when using.)
4. Remove the FFC (3) from the capstan motor by sliding the connector holder in the direction shown by the arrow.

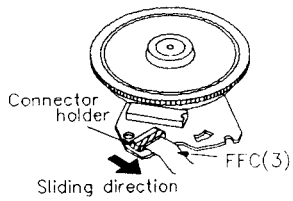


Fig. 4-16-2

5. Hold the capstan motor on the rear of the deck.
   Remove three screws on the front side of the deck and then remove the motor.

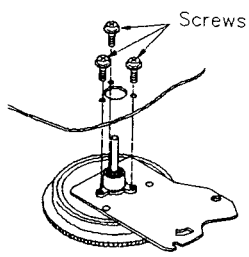


Fig. 4-16-3

6. Replace the capstan motor with a new one having the same part number.

7. First, position the capstan motor so that its direction matches to its receptacle as shown in the Fig. 4-16-4 and then mount the motor from the rear side of the deck, taking care not to damage the shaft, motor, etc. Particularly take care not to damage the F/L drive gear.

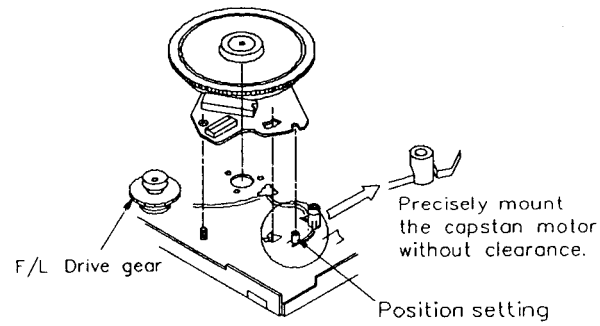


Fig. 4-16-4

8. Next, secure the capstan motor with three screws from the upper side of the deck. In this case, do not use the screws once removed. Precisely mount the motor without any clearance.

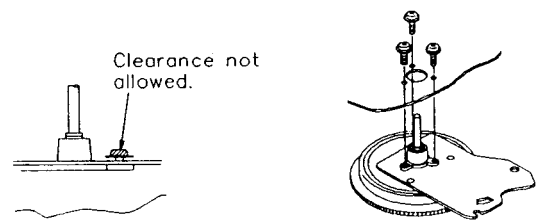


Fig. 4-16-5

9. Connect the FFC to the motor, taking care of its top and bottom side. It should be inserted with the metal terminal side facing downward. Insert the FFC and securely lock the connector by moving it as shown by the shaded arrow.

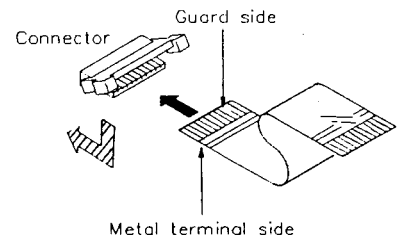


Fig. 4-16-6

10. Hereafter, proceed the remounting, using the mounting procedures in the reverse order.
    When remounting, take care that the capstan motor, reel belt, FFC, etc. are not in contact with each other. Also take care that the belt is not twisted.
11. After completion of the capstan motor replacement, check the transport characteristics according to the transport adjustment procedure. (Refer to item 1-5-4 (3).)

1-5. Check and Adjustment

1-5-1. Phase Matching of Loading Gear

1. Turn the pulley of the loading drive assembly in a counterclockwise direction (viewed from the motor shaft) until it stops, to set the loading gear to the mounting position.
   (If the turning of the pulley is difficult, disconnect the connector from the motor P.C. board and apply a voltage of 7V to pins 1 and 2.
2. Move the S, T-sliders and tension lever to the unloading positions.

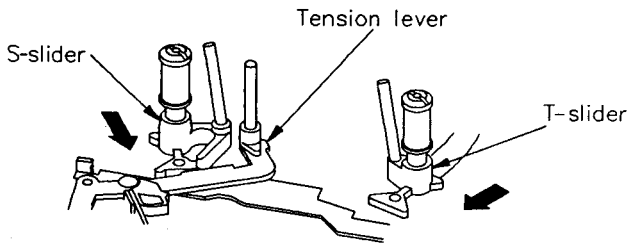


Fig. 5-1-1 Unloading position

3. Mount the T-loading gear and T-loading link assemblies on the boss provided at the T-slider (capstan side).
4. Align the two delta marks to fit the T-loading gear and S-loading gear, and then mount the S-loading gear and S-loading link assemblies.

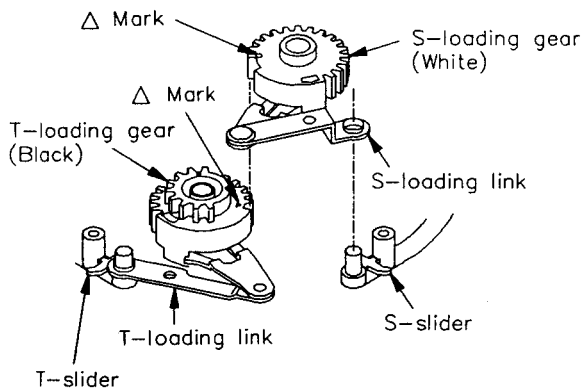


Fig. 5-1-2 Loading gear mounting

5. Align the engraved mark of the loading arm and the circular hole of the T-loading gear, and then mount the loading arm.

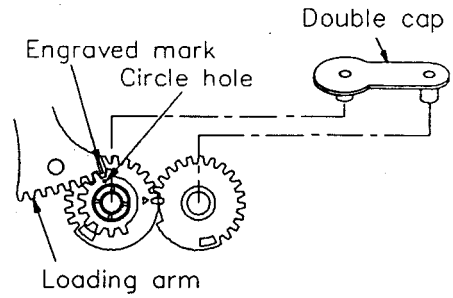


Fig. 5-1-3 Loading gear phase matching

6. Mount the double cap (larger side) to the T-loading gear side.
7. After the mounting of the parts, turn the pulley of the loading drive assembly 2 – 3 turns in the clockwise direction viewed from the motor shaft.

1-5-2. Check and Adjustment of Tension Pole Position

1. Set the deck to play mode with the front loading assembly removed.
2. Make sure the left end of the tension sleeve is 8 ± 0.5mm away from the main base edge as illustrated.
3. If necessary, loosen the screw and adjust the mounting position of the band bracket.

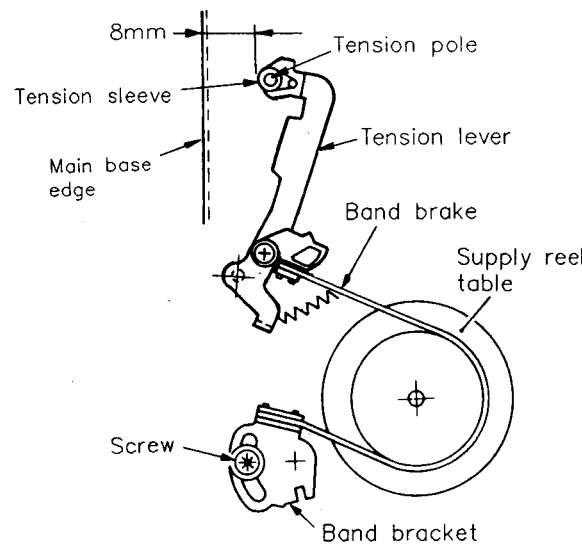


Fig. 5-2-1 Tension pole position

1-5-3. Reel Torque

(1) Reel torque

1. REVIEW mode
   Excessive torque will cause damage to the tape during REVIEW mode. On the other hand, poor torque may not wind the tape.
2. Record/Playback (take-up side) mode
   Too little torque does not rewind the tape to the end. If too large the tape may be stretched by excessive tension.
3. Inspection
   Rewind the torque cassette (recorded in SP mode) to the end, then check the torque values shown below.
   Review 160 ± 20g-cm
   Record/Playback 70 – 130g-cm

For checking the method, refer to the following item "(2) Reel torque check".

(2) Reel torque check

1. First, record a TV broadcast program on the entire torque cassette tape (KT-300NR).
2. Load the torque cassette in the VTR and feed forward the tape before proceeding with measurement.
3. Set the VTR to the REVIEW mode and feed the tape for about 15 sec., and then make sure the take-up torque of 160 ± 20g-cm is obtained while observing the left torque meter.
4. After completion of step 3, set the VTR to the PLAY mode and feed the tape for about 30 sec. Read the right torque meter and check the torque of 70 – 130g-cm is obtained.
5. When the review torque and playback torque are out of limit, replace the clutch assembly.
6. When the clutch assembly and the idle gear are replaced, perform the reel torque check.
7. Confirmation and adjustment of the back tension are performed by using a back tension cassette gauge.
   First, make sure that the tension pole is positioned correctly. (Refer to item 1-5-2).
   Load a back tension cassette and set the VTR to the PLAY mode.
   Make sure the meter is indicating 45 – 75 gf-cm.
   If the value is out of limit, first make sure the tension level spring is normal, and then replace the tension regulator assembly as required. (Refer to item 1-4-6).

PRECAUTIONS FOR USE OF TORQUE CASSETTE (KT-300NR)

1. Before loading a torque cassette in a VTR, always remove tape slack. The tape slack can be removed by rotating the reel to its take-up direction. (The tape tends to slack when there is no reel brake actions.)
2. When the torque cassette is loaded, confirm followings:
   a. Make sure the tape does not ride up or over the No. 8 cap. If it does, do not eject the tape but bring the tape to its correct position, taking care not to damage the tape.
   b. Make sure the tape is not slackened, if slackened, operate the VTR in FF or REW mode and then stop the tape. Then make sure the tape is not slackened again.
   c. After above confirmation, proceed to the reel torque adjustments and confirmation.
3. Cautions for removal of torque cassette
   a. When removing the torque cassette from the VTR, set the VTR to the STOP mode and wait for several seconds. Then, make sure the tape is not slackened. Push the EJECT button to remove the cassette.
   b. When removing the torque cassette from the VTR, also make sure the tape is not slackened inside the cassette lid before pulling the cassette from the VTR. If the tape is slackened inside the lid, carefully bring the tape in place and then pull the cassette.
4. If the previous precautions 1, 2 and 3 are not performed properly, the tape may be damaged and correct measurements can not be performed.
5. Do not use worn out or damaged tape, if used they may damage video heads on the cylinder. In such a case always replace the tape with a new one.
   The replacement tape is of E-180 type, 6.01 ± 0.3m in length.

1-5-4. Tape Transport System

The tape transport system has been precisely adjusted in the factory, so no check and alignment are necessary except the followings:

- Noises observed on the screen
- Tape damage
- Parts, shown in the adjustment procedures for the tape transport system, item 1-4-3, were replaced.

< Adjustment reference >

Lower flange height of No. 8 guide is used as the basic reference for the transport adjustment. To keep height of the No. 8 guide, do not apply excessive force onto the main base to prevent the main base from deformation.

(1) Location of tape transport adjustment

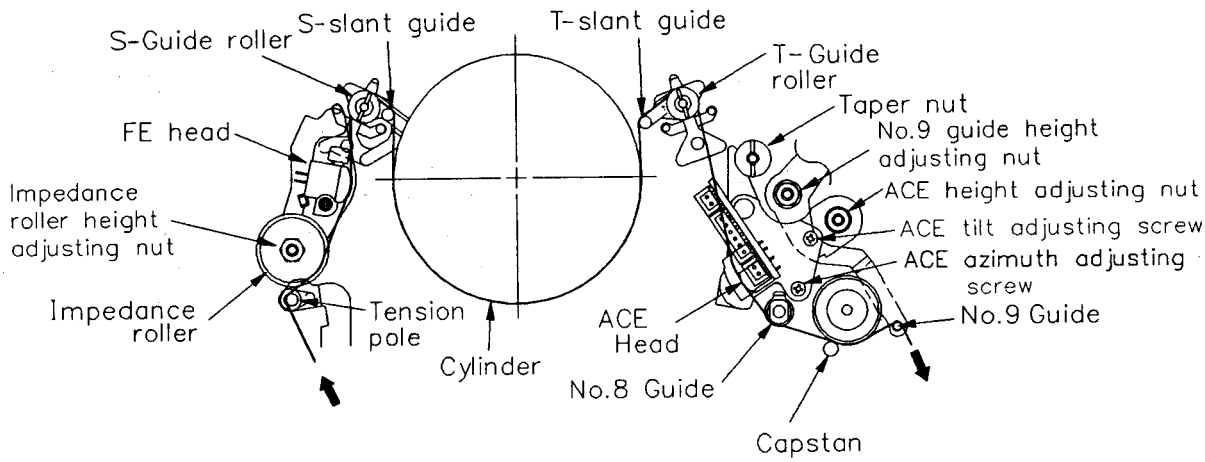


Fig. 5-4-1 Location of tape transport adjustment

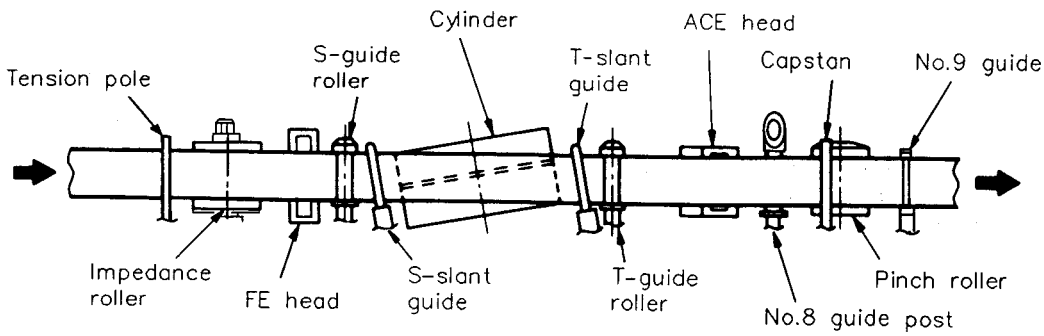


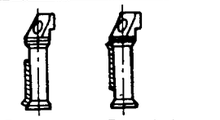
Fig. 5-4-2 Tape travel diagram

(2) Tape transport system adjustment flow chart

Cylinder assembly replacement
S.T. sliders replacement
ACE head assembly replacement
Capstan motor assembly replacement
Pinch lever assembly replacement
Cylinder motor replacement
No. 9 guide lever replacement

1) ACE assembly coarse adjustment

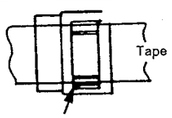
1. Audio head tilt adjustment
Play back a E-240 tape and adjust lower flange of the No. 8 guide for no wrinkle.



Turn counter-clockwise to correct
Turn clock-wise to correct

2. Audio azimuth adjustment
Play back 3kHz audio signal in alignment tape and adjust for max. output.

3. Audio head height adjustment
Set the deck to play mode, and adjust head height until lower head edge matches to lower tape edge.
Play back 400Hz audio signal in alignment tape and adjust for max. output.



Adjust head height until lower head edge matches to lower tape edge.

4. ACE head position adjustment
Play back 3MHz video signal in alignment tape
Set tracking control at its center.
Adjust taper nut for max. envelope output.

Upper cylinder assembly replacement

2) Playback phase adjustment (PG)

3) Tracking center (Subtracking) adjustment

Adjust as stated in the Electrical Adjustment Section (Servo circuit).

1. Impedance roller flange height adjustment
Run any alignment tape and adjust until tape edge moves along to lower flange.

Impedance roller replacement

S.T. guide rollers replacement
Tension lever assembly replacement
Impedance roller replacement
FE head replacement

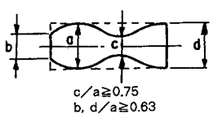
4) Linearity adjustment (S.T. guide rollers)

1. Maximum envelope output
Play back 3MHz video signal in alignment tape ST-C1 Trigger the scope with switching pulse (Ach).Turn tracking control for maximum envelope output.

2. Entrance side envelope adjustment
Rotate S-guide roller until entrance side envelope becomes as flat as possible.

3. Exit side envelope adjustment
Rotate T-guide roller until exit side envelope becomes as flat as possible.

4. Linearity check
Turn tracking control clock-wise and counterclockwise. Make sure the envelope in-creases or decreases keeping flat response.



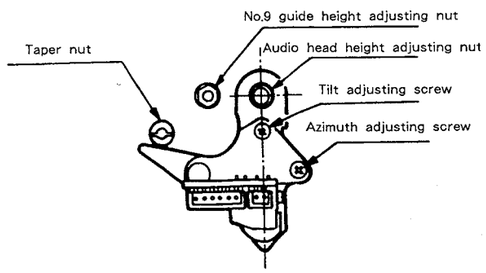
c/a≧0.75
b, d/a≧0.63

Reel clutch motor assembly adjustment
Reel table replacement
Taper nut replacement

5) ACE assembly fine adjustment

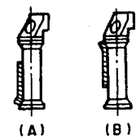
1. Audio azimuth adjustment & height adjustment
Play back 3kHz audio signal output in alignment tape ST-C1.
Adjust azimuth adjusting screw and nut for maximum output.

2. ACE head position adjustment
Set tracking control to its center click position.
Play back 3MHz video signal in alignment tape ST-C1 and adjust taper nut for maximum envelope output.



6) No. 9 guide adjustment (REV mode)

1. Tape wrinkle check
Run E-240 tape in Review mode.
Make sure tape wrinkle at upper or lower flange of No. 8 guide.



2. No. 9 guide adjustment
If tape wrinkle is observed as shown above at upper or lower flange for No. 8 guide, turn No. 9 height adjusting nut until the tape travels along lower flange.

7) Check transitional ope-ration from Review to Play

Plag back 3MHz (Ach) video signal in alignment tape ST-C1 in Review mode and then change the mode to Play mode.

Make sure that entrance side envelope changes to envelope for normal play mode within 3 sec.

Steady state is obtained within 3 sec.

YES

NO

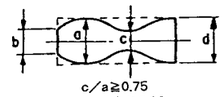
Turn impedance roller height adjusting nut counter clockwise to raise the tape.

Adjust entrance side envelope with S-guide roller.

Run E-240 tape in Review mode and then change the mode to Play mode.
Make sure no tape wrinkle is caused at lower flange of impedance roller.

8) Envelope check (playing the same VTR used for recording)

Record signals on E180 and E-240 tapes respectively and play back the signals.



c/a≧0.75
b, d/a≧0.63

9) Tape wrinkle check

Run E-240 tape in each mode and make sure no wrinkle is caused at each guide.

Play mode	Wrinkle at guide roller	to 4)
	Wrinkle No. 8 guide flange	to 1)
	Wrinkle at impedance roller	to 7)
Frame advance mode	Wrinkle at No. 8 guide flange	to 4)
Review	Wrinkle at No. 8 guide flange	to 6)

Return to the item numbered and perform adjustment again.

(3) Tape transport system adjustment

- **Pre-adjustment**

When the part(s) listed in Table 5-4-1 is replaced, perform required adjustments by referring to procedures for the tape transport system.
When the part(s) listed in Table 5-4-1 is replaced, the tape path may be changed and may damage alignment tape. To prevent this, first run a E-240 tape and make sure excessive tape wrinkle does not occur at each tape guide.

1. If tape wrinkle is observed at the lower flange of the impedance roller, decreases the lower flange height.
2. If tape wrinkle is observed at the S, T-guide rollers, turn the S, T-guide rollers until wrinkle disappears.
3. If the tape wrinkle is observed at the No. 8 guide, perform the tilt adjustment of the ACE head.

Table 5-4-1

Parts replacement	Adjustment procedure
● Cylinder complete assembly ● S, T-sliders ● ACE head assembly ● Capstan motor assembly ● Pinch lever assembly ● Cylinder motor ● No. 9 guide lever assembly	From item 1)
● Upper cylinder	From item 2)
● S, T-guide rollers ● Tension lever assembly ● Impedance roller ● FE haed ● No. 8 guide sleeve	From item 4)
● Reel clutch assembly ● Reel table (S, T) ● Taper nut	From item 5)

- **Adjustment procedures**

1) ACE head assembly coarse adjustment

a. ACE tilt adjustment

1. Play back a E-240 tape and observe running condition of the tape at the lower flange of No. 8 guide.

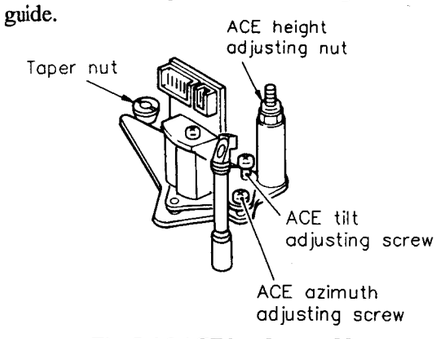


Fig. 5-4-3 ACE head assembly

2. Adjust the ACE tilt adjusting screw until tape wrinkle is caused at the lower flange of No. 8 guide as shown in Fig. 5-4-4(A).
3. Turn the ACE tilt adjusting screw counterclockwise until the tape travels along the lower flange as shown in Fig. 5-4-4(B).

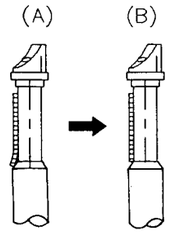


Fig. 5-4-4 No. 8 guide check

b. Audio azimuth adjustment

1. Play back the 3 kHz audio signal on the alignment tape ST-C1.
2. Connect a millivoltmeter to the audio line output terminal.
3. Turn the ACE azimuth adjusting screw to obtain maximum audio output.

c. Audio head height adjustment

1. Run the alignment tape (ST-C1) in the playback mode.
2. Observe surface of the audio head using a dental mirror.
3. Turn the ACE height adjusting nut so that lower tape edge matches to the lower edge of the control head.
4. Play back the 400 Hz audio signal in the alignment tape (ST-C1) and adjust the head height for maximum audio output.

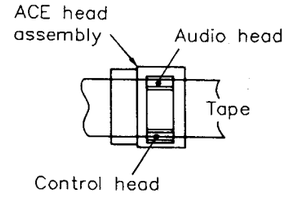


Fig. 5-4-5 Head height

d. ACE head position pre-adjustment

1. Play back the 3 MHz video signal in the alignment tape (ST-C1).
2. Adjust the taper nut for maximum video signal output after the tracking control is set at its center position.

2) Playback phase adjustment

Perform the adjustment according to the methods stated in the electrical adjustment "Servo Circuit".

3) Tracking center (Subtracking) adjustment

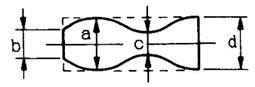
Perform the adjustment according to the methods stated in the electrical adjustment "Servo Circuit".

4) Linearity adjustment (S, T-guide rollers adjustment)

1. Play back the 3 MHz (A ch) video signal on the alignment tape (ST-C1).
2. Observe the video RF signal envelope on an oscilloscope triggered by the video switching pulse.
3. Make sure the video envelope waveform (in its maximum output) meets the specification shown in Fig. 5-4-6.

Note:

a = maximum output of the video RF envelope
b = minimum output of the video RF envelope at the entrance side
c = minimum output of the video RF envelope at the center point
d = minimum output of the video RF envelope at the exit side



b, d/a ≧ 0.63
c/a ≧ 0.75

Fig. 5-4-6 Envelope waveform adjustment

4. If the A section in Fig. 5-4-7 does not meet the specification, adjust the S-guide roller in up or down direction.
5. If the B section in Fig. 5-4-7 does not meet the specification, adjust T-guide roller in up or down direction.

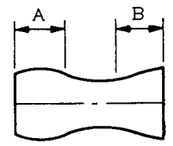


Fig. 5-4-7 Adjustment points

6. After completion of the adjustment(s), turn the tracking control and make sure video envelope variations are almost flat.
   Next, play back the 3 MHz signal on the alignment tape (ST-C1) and make sure the video RF envelope variations are also flat when the tracking control is turned.
7. If the envelope varies as shown in Fig. 5-4-8, adjustment of the S, T-guide rollers may be upset, if so perform the adjustment again.

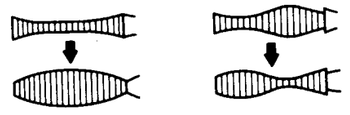


Fig. 5-4-8 Abnormal variation of the waveform

5) ACE head assembly fine adjustment

a. Tape wrinkle check at the lower flange of No. 8 guide

1. If tape wrinkle is observed at the lower flange of No. 8 guide, adjust the ACE tilt adjusting screw counterclockwise as shown in Fig. 5-4-3 until the wrinkle disappears.
2. If a gap is observed between the lower flange of No. 8 guide and the lower edge of tape, adjust the ACE tilt adjusting screw clockwise until the tape travels along the lower flange.

Note:

This adjustment should be made using a beginning part of E-240 tape.

b. Azimuth adjustment

1. Play back the 3 kHz audio signal on the alignment tape (ST-C1).
2. Adjust the ACE azimuth adjusting screw for maximum audio output as shown in Fig. 5-4-3.

c. Head height adjustment

1. Play back the alignment tape.
2. Adjust the ACE height adjusting nut for maximum audio output.

d. ACE head position adjustment

1. Play back the 3 MHz (Ach) video signal on the on the alignment tape (ST-C1).
2. Place the tracking control at its center click position.
3. Trigger the oscilloscope with the video switching pulse and observe the video RF envelope waveform.
4. Turn the taper nut slowly and fix the taper nut at the position where the video envelope reaches a peak level.

Note:

- If video RF signal is not observed with the tracking control set to the center position, perform the ACE head adjustment to obtain maximum video RF envelope in each mode, again.

5. Play back the audio signal on the alignment tape (ST-C1) and make sure the audio output is maximum.

6) No. 9 guide lever adjustment

1. Set the VTR to Cue mode with E-240 tape (at beginning portion) loaded. Switch the Cue mode to the Review mode when the tape has been rewound into the T-reel table to some extent.
2. Check tape wrinkle at the upper and lower flange of No. 8 guide.
   Adjust the No. 9 height adjusting nut so that the tape runs along the lower flange.
3. Set the VTR to the Cue mode again and make sure the tape is not twisted between the capstan and the No. 9 guide. If twisted, adjust the No. 9 guide height and the adjustment in step 1 again.

Note:

When making the adjustment, do not mistake the ACE head height adjusting nut for the No. 9 adjusting nut.

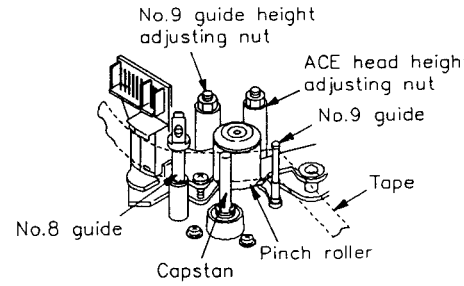


Fig. 5-4-9 No. 9 guide lever adjustment

7) Check for transitional operation from Review to Play

1. Play back the 3 MHz (Ach) video signal on the alignment tape (ST-C1) in Review mode and observe the video RF envelope with the oscilloscope.
2. Switch the Review mode to the Play mode.
   When switched to the Play mode, make sure the entrance side envelope comes to an approximate steady state within 3 seconds as shown in Fig. 5-4-10.

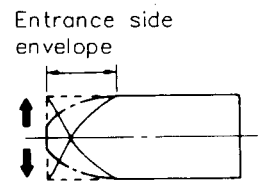


Fig. 5-4-10 Video envelope rising when operation mode is switch from review to play mode

If it does not rise within 3 seconds, adjust as follows:

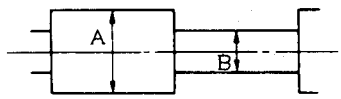
3. Turn the impedance roller nut counterclockwise to adjust the lower flange height.
   Make sure the tape travels along the lower flange.
4. Since entrance side linearity varies as the height of the lower flange of the impedance roller is varied, adjust the S-guide roller to correct the linearity.
5. Change operation mode from the Review to the Play mode again and make sure the entrance side envelope rises within 3 seconds. If not, perform the adjustment again from item 3.
6. Play back the E180 tape in the Play mode and make sure no tape wrinkle occurs at the lower flange of the impedance roller. If excessive tape wrinkle occurs, turn the impedance roller nut clockwise until the wrinkle disappears and then perform adjustment from item 4.

Note:

If the rising characteristic is poor in Review mode, screen noises may occur in synchronous editing recording.
Perform the adjustment carefully.

8) Envelope check

1. Make recordings and play back on E-180 and E-240 tapes, and make sure the playback output envelope meets the specification shown in Fig. 5-4-6.
2. In playback using the same video deck as used for the recording, (with a E-180) the video envelope should meet the specification shown in Fig. 5-4-11.



● B/A ≦ 0.55

Fig. 5-4-11 Envelope output and output level difference

3. If the performance does not meet both specifications 1 and 2 above, replace the upper cylinder assembly.
4. Confirm operation of the synchronous editing, using a beginning portion a E-180 tape.
5. If picture noises are observed at the starting position of the editing, adjust the height of the lower flange of the impedance roller again.

9) Tape wrinkle check

1. Play back the E-240 tape in the playback, Cue, Review and the frame feeding mode, and observe tape wrinkle at each guide.
2. If excessive tape wrinkle is observed at the mode shown below, perform the associated adjustments also shown below.
   a. Playback mode
      Tape wrinkle at the S, T-guide roller section
      Item 4: Linearity adjustment
      Tape wrinkle at No. 8 guide flange
      Item 1: ACE head assembly coarse adjustment
      Tape wrinkle at impedance roller flange
      Item 7: Check for transitional operations from Review to Play
   b. Review mode
      Tape wrinkle at No. 8 guide
      Item 6: No. 9 guide lever adjustment
   c. Frame feeding mode
      Tape wrinkle at No. 8 guide
      Item 4: Linearity adjustment

2. ELECTRICAL ADJUSTMENT

<Test equipment required>

Adjustment will be performed with the following test equipment.

1. Color TV (Monitor)
2. Oscilloscope, 2 CHs, 15 MHz or higher with delay system
3. Frequency counter (7 digits or higher)
4. Millivoltmeter
5. Digital voltmeter
6. Tester (20K ohm/V)
7. Audio generator
8. Audio attenuator
9. Alignment tapes
   Part code: ST-C1: 70909227
10. Alignment screw driver (jig)
11. Color pattern generator
12. Video sweep generator
13. Patch cord
    Part code: 70909331

<Color bar signal>

Color bar signals of 75% recorded on the alignment tapes are shown in Fig. 2-1-1.

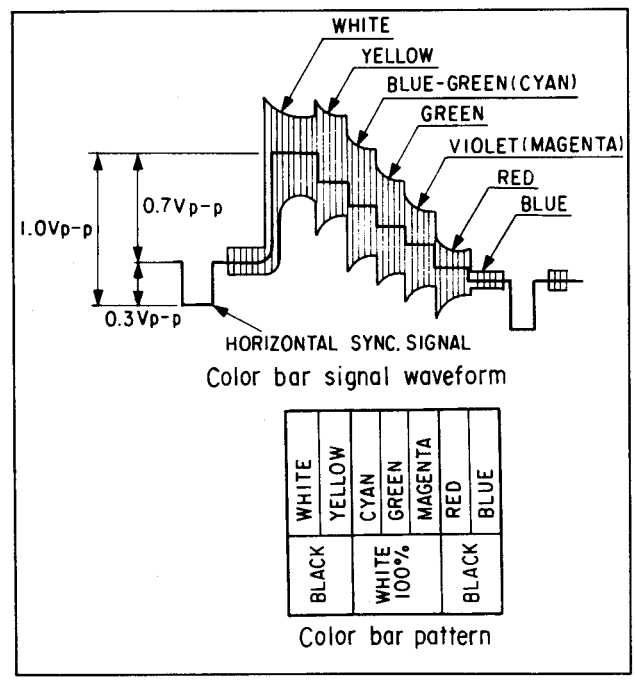


Fig. 2-1-1

<Specified input and output levels, and impedance>

Video input: Negative sync, standard composite video signal 1Vp-p, 75 ohm

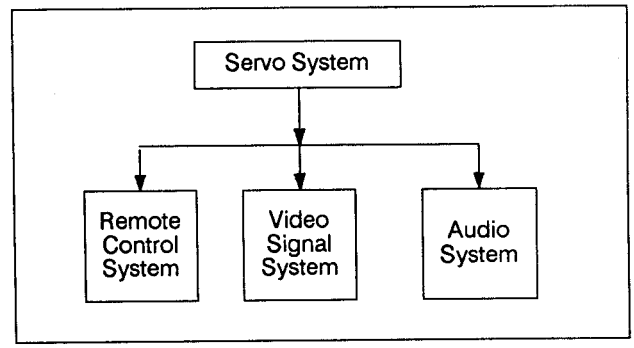
Video output: Same as the video input. 1Vp-p, 75 ohm

Audio input: –5 dBs, more than 10k ohm

Audio output: –5dBs, less than 1k ohm

<Alignment sequence>

Proceed the alignments in the sequence as shown in Fig. 2-1-2.



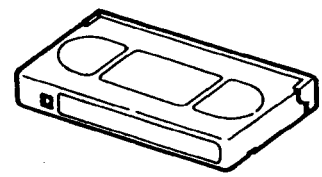


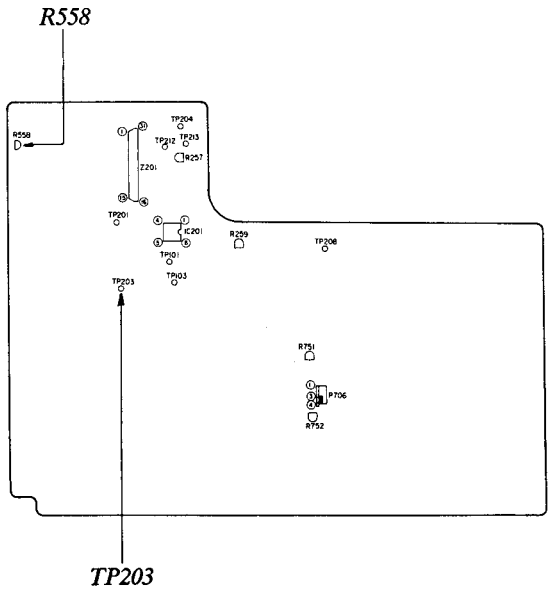
Fig. 2-1-2

Alignment tape specifications

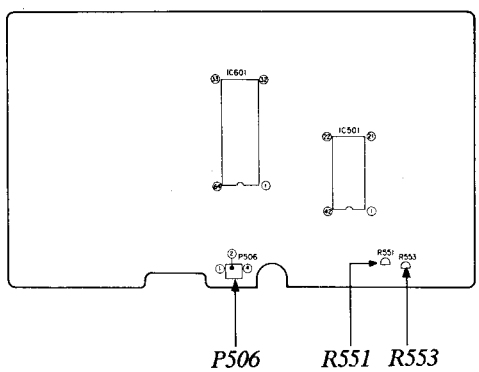
[1] ST-C1

Segment	System	Playback Time (min.)	Video Signal	Audio Signal	Applications
1	PAL & SECAM	10	Mono Scope	1 kHz	Servo checks and adjustment
2	PAL & SECAM	10	3 MHz Ach	400 Hz	Tape path checks and adjustment
3	PAL	5	Color bar	3 kHz	Video and Sound checks and adjustment
4	SECAM	5	Color bar	3 kHz	Video and Sound checks and adjustment
5	MESECAM	5	Color bar	3 kHz	Video and Sound checks
6	NTSC	5	Color bar	1 kHz	Video and Sound checks

2-1. Servo Circuit



Main PC Board

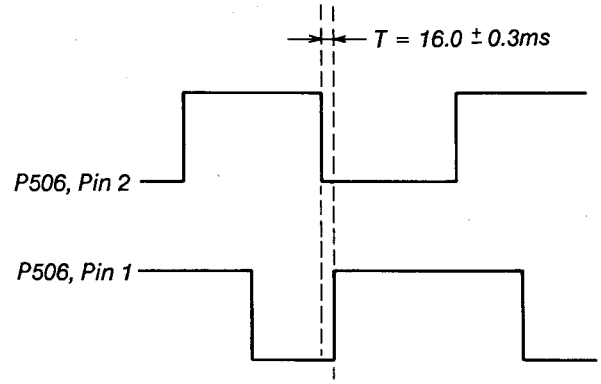


Sub Main PC Board

2-1-1. Tracking

Test point: Pin 2 of P506 (SW pulse),
Pin 1 of P506 (CTL pulse)
Test equipment: Oscilloscope (chop mode)
Adjusting point: R553

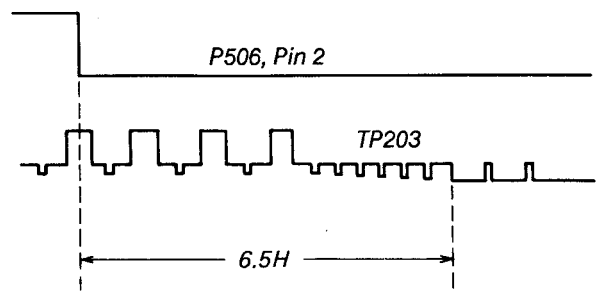
1. Place the tracking control in the center click position.
2. Play back a recorded tape.
3. Connect the A-CH input to pin 2 of P506 (SW pulse) and the B-CH to pin 1 of P506 (CTL pulse). Trigger the oscilloscope with the SW pulse.
4. Adjust R553 so that T becomes 16.0 ± 0.3ms .



2-1-2. Playback Phase

Test point: Pin 2 of P506 (SW pulse),
TP203 (VIDEO)
Test equipment: Oscilloscope (chop mode)
Adjusting point: R551

1. Playback the alignment tape (ST-C1: PAL mode). (Tracking control knob at its center click position)
2. Set the oscilloscope to the chop mode, and externally trigger the scope with the SW pulse. Connect the A-CH input to the SW pulse (Pin 2 of P506) and the B-CH to the video signal (TP203).
3. Adjust R551 to position the falling edge of the SW pulse at 6.5H ± 0.5H from the V-sync front edge of the video signal.



2-1-3. V-sync Correction

Test point: —
Test equipment: Color monitor
Adjusting point: R558 (on rear panel)

1. Play back the monoscope or color bar signal on the alignment tape ST-C1.
2. Set the VTR to still mode.
   Adjust R558 on rear panel until center part of the picture stops.

2-2. Video Circuit

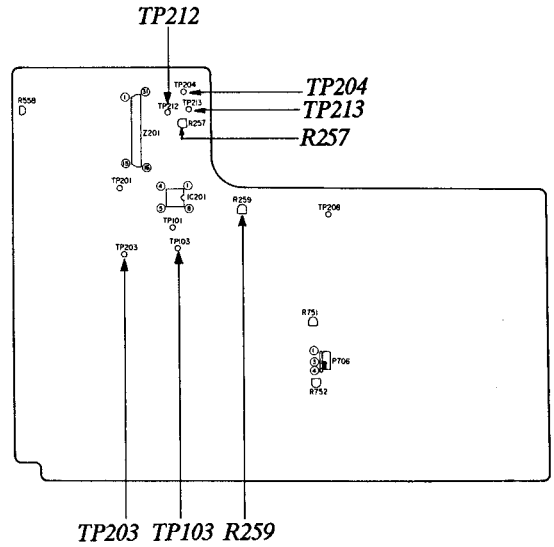
Note:

* Set the channel to "0" when feeding signal to LINE terminals.

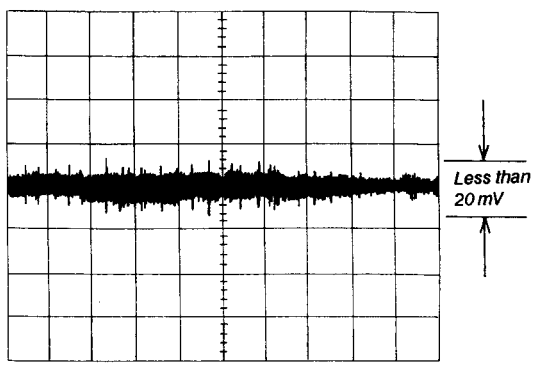
2-2-1. Y Comb-filter Balance

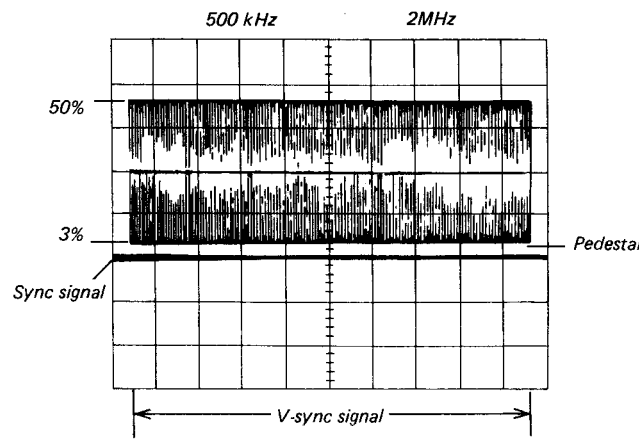
Test point: TP212, TP213, TP204
Test equipment: Oscilloscope
Adjusting point: R257

1. Play back the test tape (PAL color bar signal).
2. Connect the oscilloscope (CH-1) to TP212 and the (CH-2) to TP213, and trigger the scope with HD pulse at TP204. Adjust the scope so that a waveform is displayed for approx. 2H period.
3. Adjust the scope so that amplitude gain for each channel is the same.
4. Set polarity of the CH-2 to the negative (INV) mode.
5. Set the scope to ADD mode which adds signals in the CH-1 and CH-2.
   Adjust R257 so that amplitude on the scope display shows less than 20mV. (Ignore glitches.)



Main PC Board



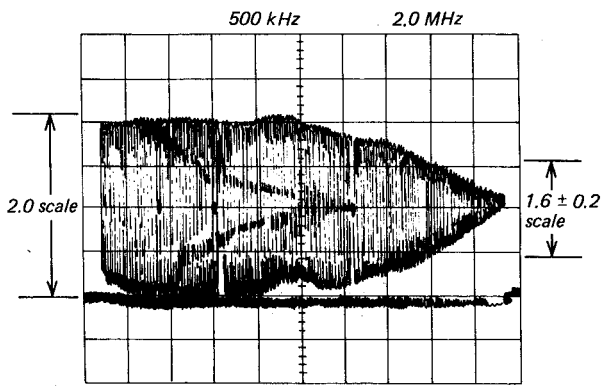


Input sweep signal

2-2-2. Picture Sharpness Preset

Test point: TP203, TP103
Test equipment: Oscilloscope
Adjusting point: R259

1. Place the sharpness control in its center click position.
2. Record and play back a video sweep signal fed to the line input terminals.
3. Connect the oscilloscope to TP203 and trigger the scope with a signal at TP103. Adjust the scope so that a waveform is displayed for more than 1V (vertical sync) period.
4. Adjust R259 so that relative amplitude at 2 MHz shows 1.6 ± 0.2 (scale), where amplitude at 500 kHz is assumed as "A" (A = 2 scale).
5. Confirm that 2 MHz level increases when the sharpness control is turned clockwise and decreases when turned counterclockwise. Then replace the control at its center click position.



Playback waveform of TP203

2-3. Audio Circuit

Note:

* Adjustments for the playback frequency response and playback output level may not be performed if the audio control head is improperly positioned on the audio track. In such a case, perform the azimuth adjustment and height adjustment perfectly, and then proceed with the adjustments 2-3-1 to 2-3-4.
* When using alignment tapes other than those specified below always make sure that interchangeability is assured for the tapes before proceeding the adjustments.

2-3-1. Playback Output Level

Test point: Audio line output terminal
Test equipment: Millivoltmeter
Adjusting point: R751

1. Connect 10k ohm to the audio line output terminal and playback the alignment tape (ST-C1).
2. Adjust R751 until output level obtains –5 dBs ± 0.5 dB.

2-3-2. Record/Erase Oscillator Frequency

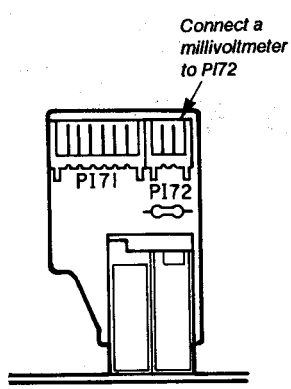
Test point: P706 pin 3 – 4 (GND)
Test equipment: Frequency counter

1. Connect the frequency counter across P706 pin 3 and pin 4 (GND).
2. Set the VTR to record mode and check that the frequency counter shows 70 kHz $\pm^{9}_{7}$ kHz.

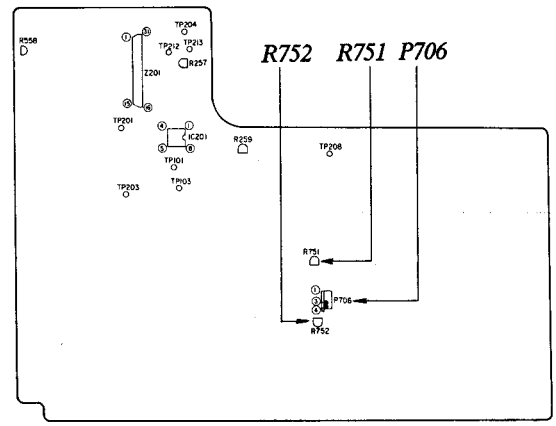
2-3-3. Bias Current

Test point: Pins 1 and 2 of PI72
Test equipment: Millivoltmeter
Adjusting point: R752

1. Short circuit the audio line input terminal, creating a no input signal condition. Connect a millivoltmeter to pins 1 and 2 (GND) of PI72.
2. Set the VTR to the record mode and adjust R752 to obtain 3.0mVrms.



ACE Head P.C. Board



Main PC Board

2-3-4. Record/Playback Frequency Characteristics

Test point: Audio line output terminal
Test equipment: Millivoltmeter
Adjusting point: R752

1. Connect a 10k ohm resistor to the audio line output terminal.
2. Apply 400 Hz and 8 kHz signals of –25 dBs to audio line input terminal, and record the signal.
3. Play back the signals just recorded and check that the output of 8 kHz is 0 dB $^{+4\ dB}_{-5\ dB}$, referred to the output of 400 Hz.
4. If the 8 kHz output level is higher than that of 400 Hz by more than 4 dB, adjust the bias current to a value higher than 3.0mVrms; and if the 8 kHz output is lower than that by less than –5 dB, adjust the bias current to a value lower than 3.0mVrms.

2-3-5. Record/Playback Output Level

Test point: Audio line output terminal
Test equipment: Millivoltmeter

1. Connect a 10k ohm resistor to the audio line output.
2. Feed 400 Hz, –5.0 dBs signal to the audio line input terminal and record the signal.
3. Confirm to see the playback output level is –5 dBs ± 3 dB.

SECTION 3
SERVICING DIAGRAMS

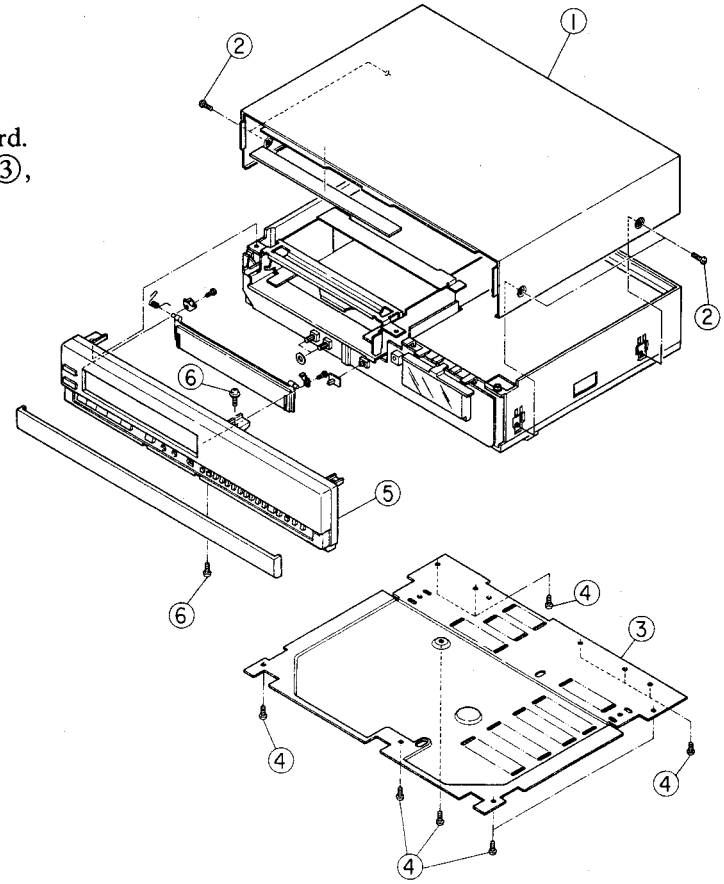
1. Inspection Procedure

Operation steps		Items to be confirmed	Inspection block	Page	
				Block Diagram	Circuit Diagram
1. AC Plug-in	Time setting Program timer setting	Clock display Time setting operation	Power (AC system) Timer OSP	3-10 3-13 3-31	3-37 3-41 3-73
2. Power SW ON Channel selection,	Timer/counter, Memory Channel select operation, AFC operation, EE picture & tone quality	Mode display lamp TV receive condition, RF reception AFC operation level, EE picture quality, Tone signal level	Power Logic Video (EE, Rec mode) Audio (EE, Rec mode)	3-10 3-18 3-11 3-29 3-32	3-35 3-47 3-39 3-61, 65 3-76
3. Cassette-in and Cassette-out	Cassette-in Cassette loading Eject Cassette-out	F/L mecha. operation Cassette loading operation Eject operation Indicator lamp Abnormal sound	Logic	3-18	3-47
4. Key entry operation Remote control	REC, PLAY Cue/Review Still, Frame feeding/slow FF/REW Memory	Indicator lamp Each mode operation (Tape drive operation) Abnormal sound Memory operation	Logic Remote control	3-18	3-47 3-83
5. Special Functions Fully Automatic Play Auto Rewind	Cassette-in at Power OFF REC/PLAY/CUE	Power ON, Cassette down Automatic Play Power OFF after REW Rewind automatically after tape wound	Power Logic	3-10 3-18	3-37 3-47
6. Playback Function Picture Sharpness Tone Quality Others	PLAY (Test tape: ST-C1) Cue/Review Still/Slow	Resolution, S/N Hue, Saturation, Color unevenness, Color dropout, Sound distortion, Level variation, Picture noise, Jitter Picture swing, Skew distortion, Flicker, Beat	Video PLAY system Audio PLAY system Servo system	3-29 3-32 3-24	3-61, 65 3-76 3-51
7. REC/PLAY Functions Picture Sharpness Tone Quality Others	REC/PLAY	Resolution, S/N Hue, Saturation, Color unevenness, Color dropout, Sound distortion, Level variation, Picture noise, Jitter Picture swing, Skew distortion, Flicker, Beat	Video PLAY system Audio PLAY system Servo system	3-29 3-32 3-24	3-61, 65 3-76 3-51

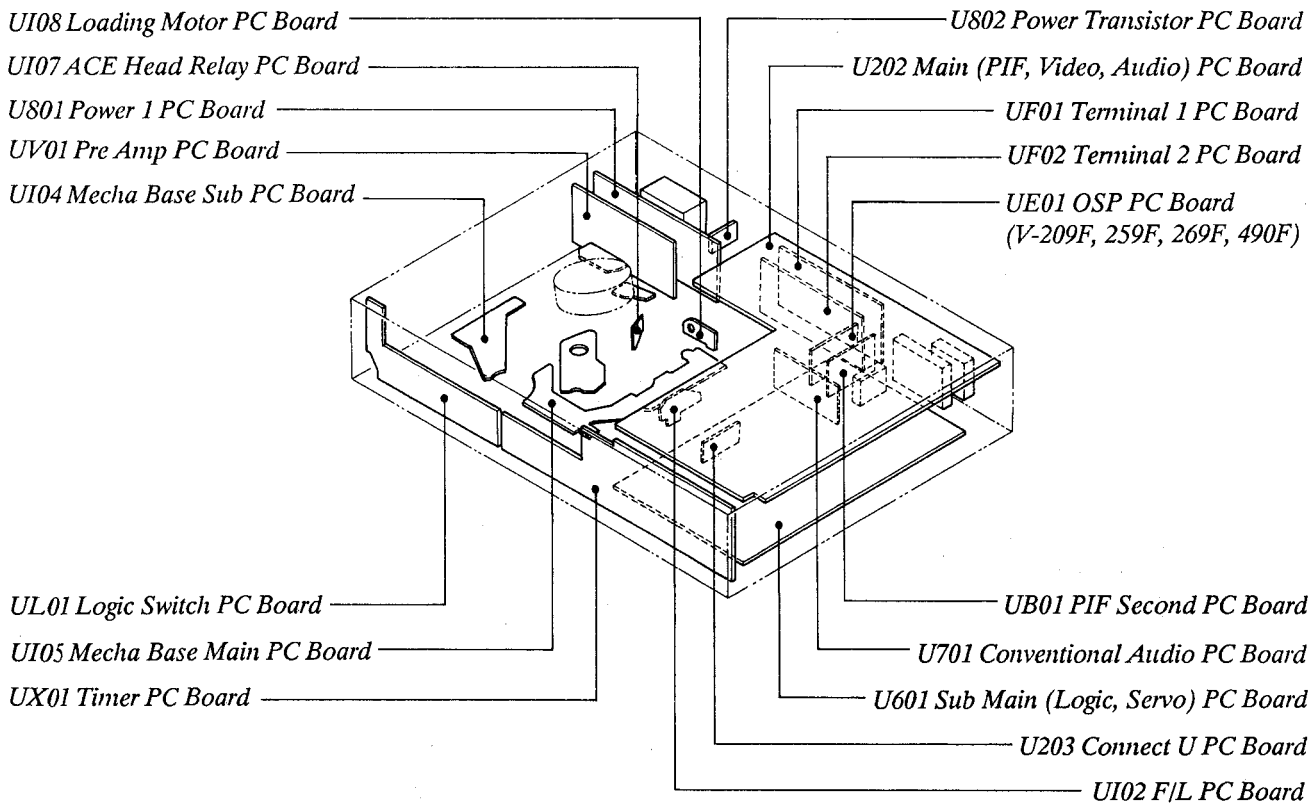
How to use the table
1. When inspecting a defective VTR, proceed according to the steps shown in the table.
2. Check the items to be confirmed for each operation step.
3. If a problem is found on the item, check waveforms (level) referring to the block diagram relating to the items.
4. Use PC board pattern diagram and schematic diagram to examine the circuit precisely.
5. After completion of the repair work, check steps 1 – 7 again.

2. Removal of Cabinet

1. Disconnect power cord plug from AC outlet.
2. Remove 4 screws ②securing top cover ①.
3. Remove the top cover 1 by sliding it backward.
4. Remove 10 screws ④securing bottom cover ③, then remove the bottom cover.
5. Remove 2 screws ⑥securing front panel ⑤.
6. Remove the front panel ⑤.

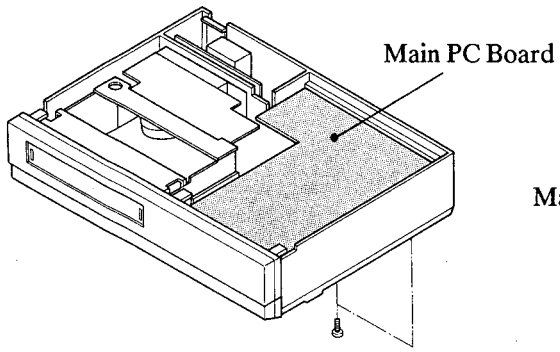


3. Electrical Units Location Diagram



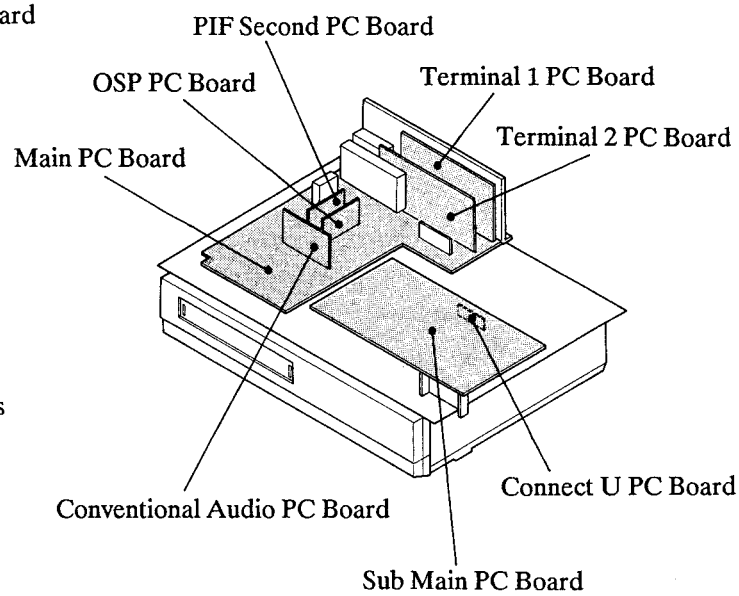
4. Standing PC Boards for Servicing

Main (Video, Audio, PIF) PC Board

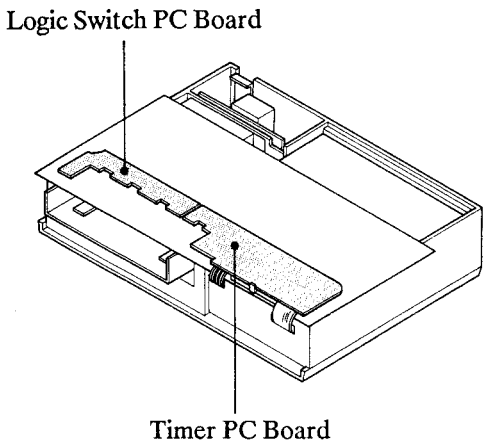


Note:
Before removing the Main PC Board, remove 2 screws from the top plate.

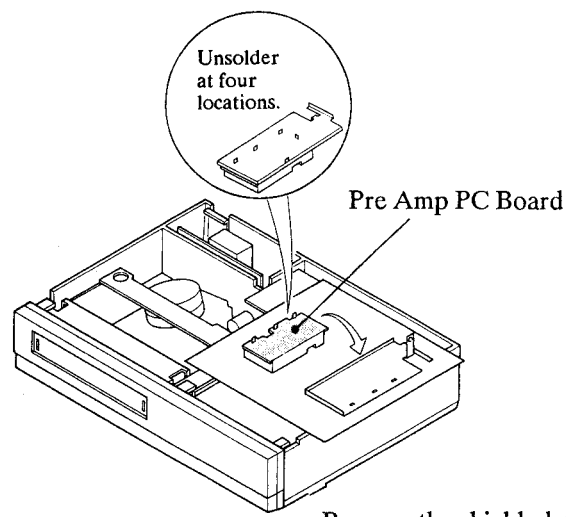
Main, Sub Main, Terminal 1, Terminal 2, OSP, PIF Second, Conventional Audio, Connect U PC Board



Timer, Logic Switch PC Board

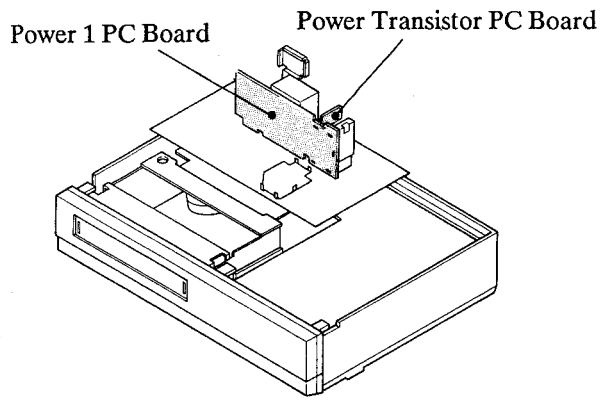


Pre Amp PC Board



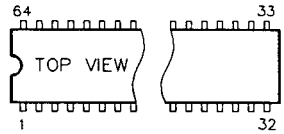
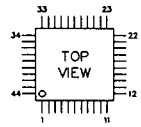
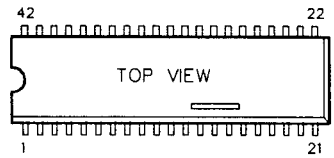
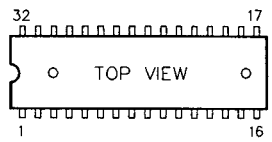
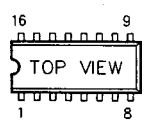
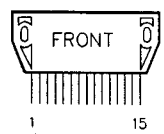
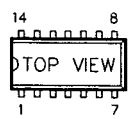
Remove the shield plate.

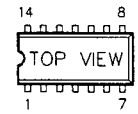
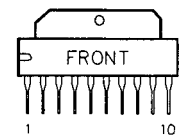
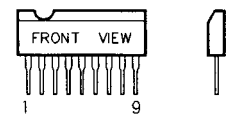
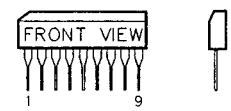
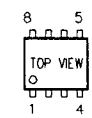
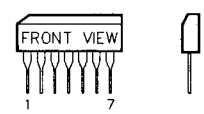
Power 1 , Power Transistor PC Board



5. Part Configuration and their Symbols

1. ICs

NAME	SHAPE
M50957-199SP TMP47C860N-2084Z	
BA7259AK	
TD6372N-E2 TMP47C800N-2278Z	
M50552-082SP	
BA7765AS	
TA8632F	
TC4021 TC4053BP	
STK7253	
LM2902N	

NAME	SHAPE
AN3313	
TA7291P	
BA7021 BA7611N	
LVA519S TA75393S TA75393P TA75557S	
ICT93C46 MSM6965-3RS	
TA7347P	
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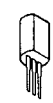
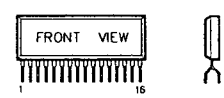
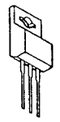
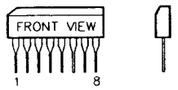
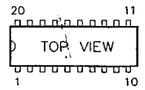
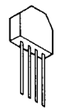
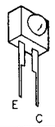
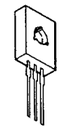
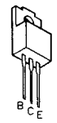
S8054ALP	
LA7311	

NAME	SHAPE
AN7809F AN7812F	
M5201L	
TDA8192	

2. TRANSISTORs

NAME	SHAPE
2SC1815 Y 2SC1959-Y	
THS114	
PT493F PT361F	
2SA966-Y(C) 2SC2236-Y(C)	
RN1204,RN1202,2SA1297Y RN1203,RN1201 RN2201,RN1206 RN2202,RN2204 RN2203,2SC2458-Y RN2206,2SA1048-Y	

NAME	SHAPE
2SD1379	
2SA1015-Y 2SD1405-BL 2SD1413	

3. DIODEs

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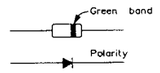
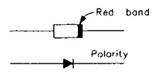
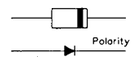
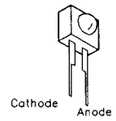
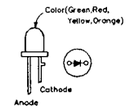
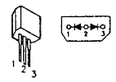
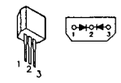
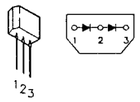
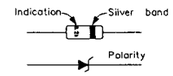
1SS177 1SS176	
EQA02-05E ERA15-02	
ERC04-02F	
GL451V	
TLG133A FA	
1SS200	

NAME	SHAPE
1SS201	
DA218S	
04AZ10-Y 04AZ12-Y 04AZ33Y 04AZ13Z	

PRECAUTIONS FOR PART REPLACEMENT

* In the schematic diagram, parts marked ! (ex. ! F801) are critical part to meet the safety regulations, so always use the parts bearing specified part codes (SN) when replacing them.
* Using the parts other than those specified shall violate the regulations, and may cause troubles such as operation failures, fire, etc.

SOLID RESISTOR INDICATION

Resistor	1/6W film	P type film	U type film	Solid	Oxide film	Metal film	Cement	Fuse
Symbol	None	P	U	S	R	W	W	RF

Tolerance	±2%	±5%	±10%	±20%
Symbol	G	J	None	None

* All film type and oxide film resistors are ±5%, so the tolerance symbol was not indicated for them.

CAPACITANCE INDICATION

Description	Symbol	Capacitance, unit	Capacitance allowance
Electrolytic		μF	Not indicated
Special electrolytic			Indicated
Plastic film		μF: indicated with numbers below decimal point	Indicated below ±5% (J), indicated below ±0.5pF, not indicated for others
Ceramic		pF: indicated with numbers over decimal point	
Trimmer		pF	Not indicated

Note: No working voltage is indicated for capacitors rated at 50V except electrolytic capacitors.

WAVEFORM AND VOLTAGE MEASUREMENT

* Measurement of waveform and voltage at each section in the color circuits was conducted with sufficient service color bar signal being received and reproduced in normal conditions.
* Waveforms and voltage values for the remaining circuit were measured with a broadcasting signal normally received, so they may vary slightly according to the programs being received. Use them as a measure for servicing.
* All voltage values except the waveforms are expressed in DC and measured by a digital voltmeter.

CHIP PART REPLACEMENT

(Use spare part with wire leads connected.)

1. Hold a Chip part to be removed with tweezers and apply heat to the solder at one end of the part with a soldering iron. (Fig. 1)
2. Apply heat to the solder at the other end of the part and remove it.
   The heating time should be as short as possible so the excessive heat is not applied to foil patterns and the PC Board.
3. If it is difficult to remove the part, temporarily stop the desoldering job and wait until temperature of the part lowers. Then, repeat steps 1 and 2.
4. Form leads of the replacement part (general part equivalent to the chip part) as shown in the figures and solder place. (Fig. 2)
5. Mount the replacement part so that it does not touch any other parts. (Fig. 3)

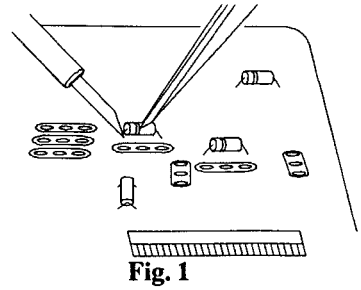


Fig. 1

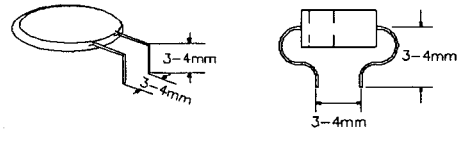


Fig. 2

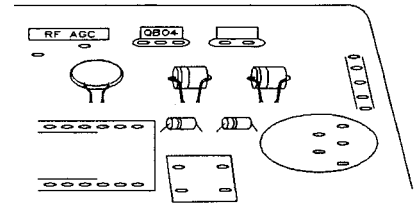
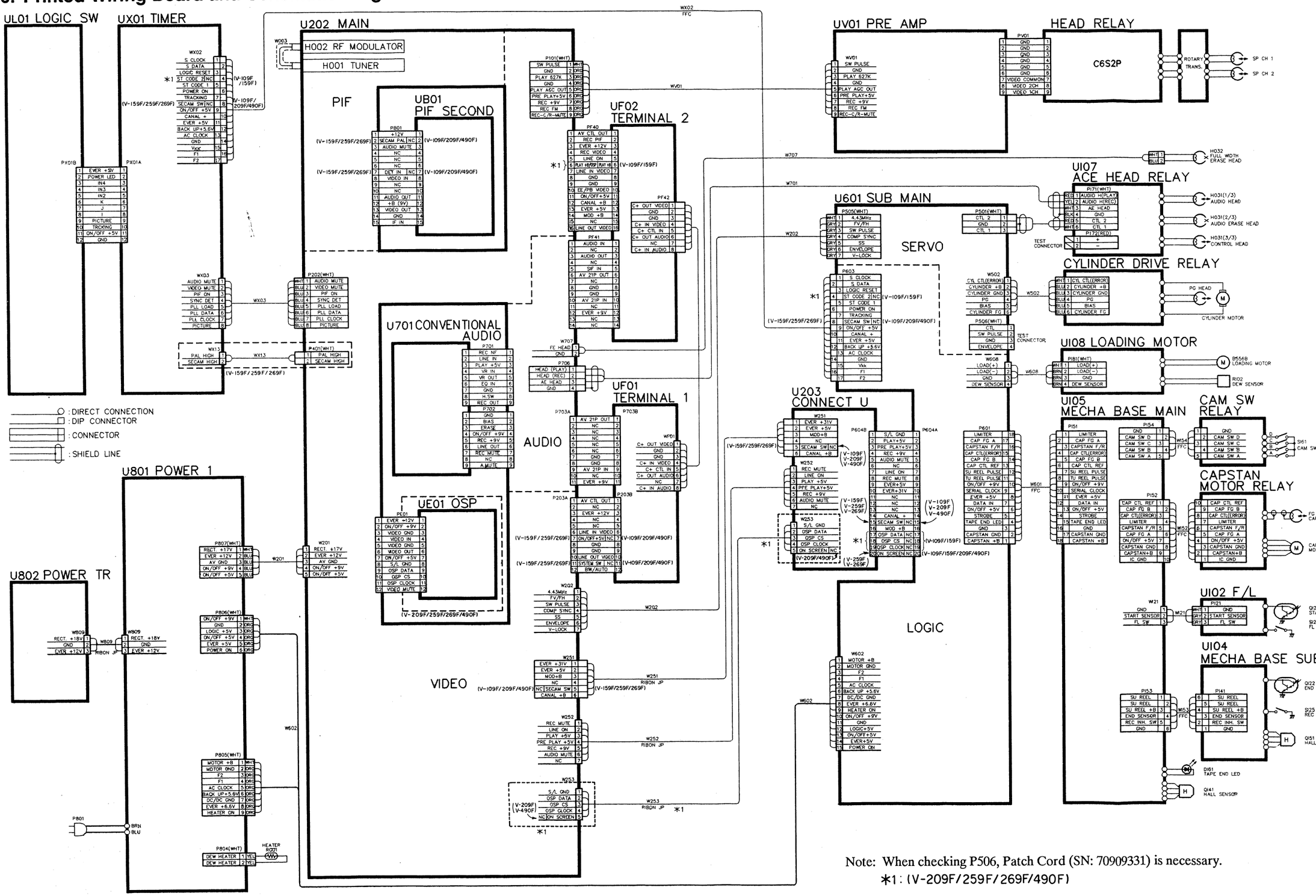
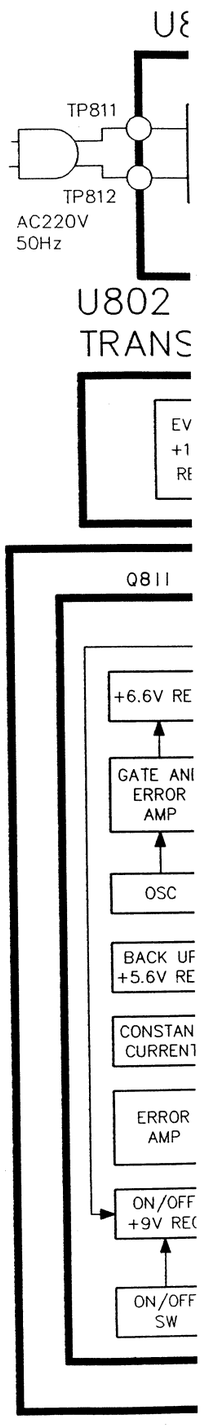
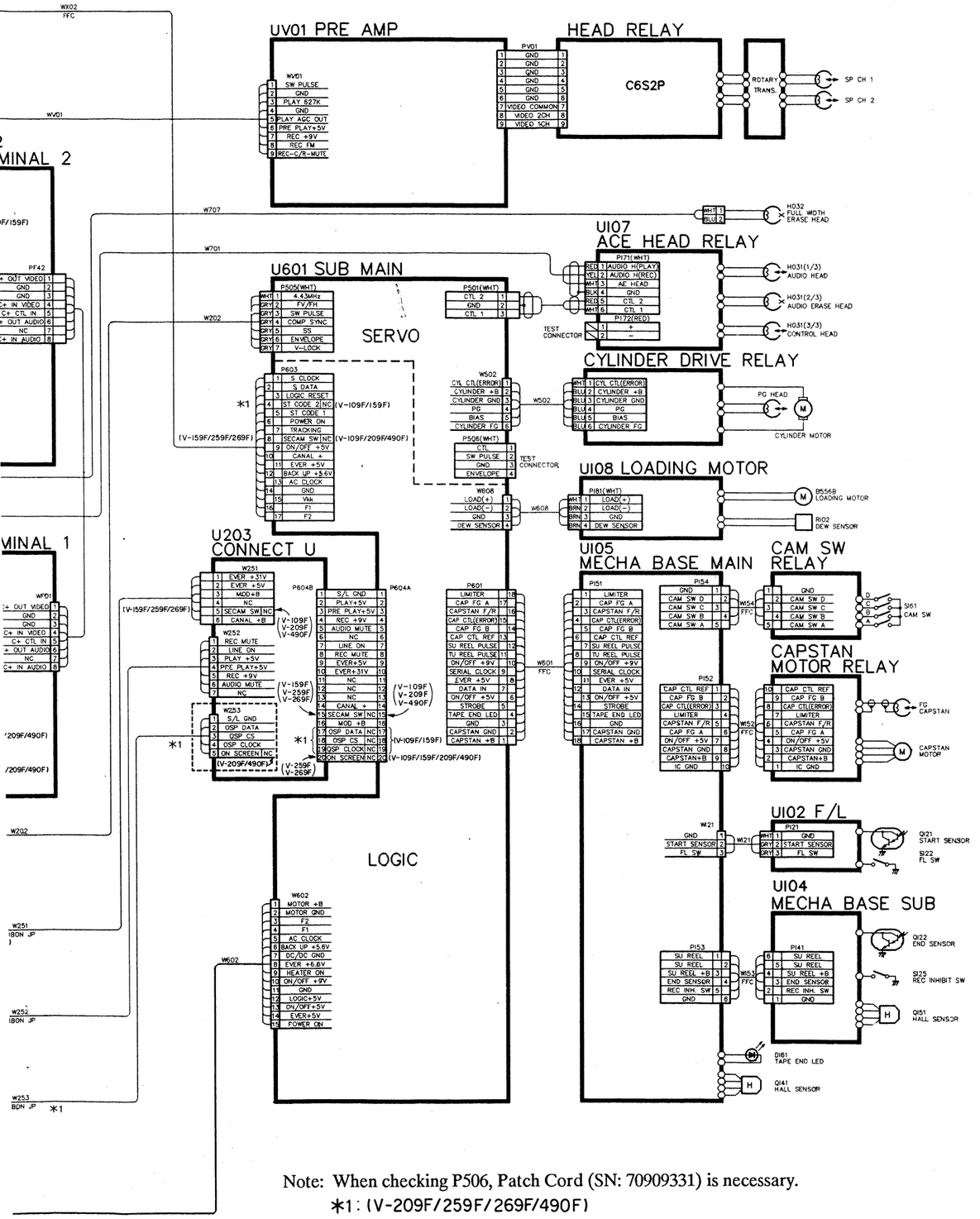


Fig. 3



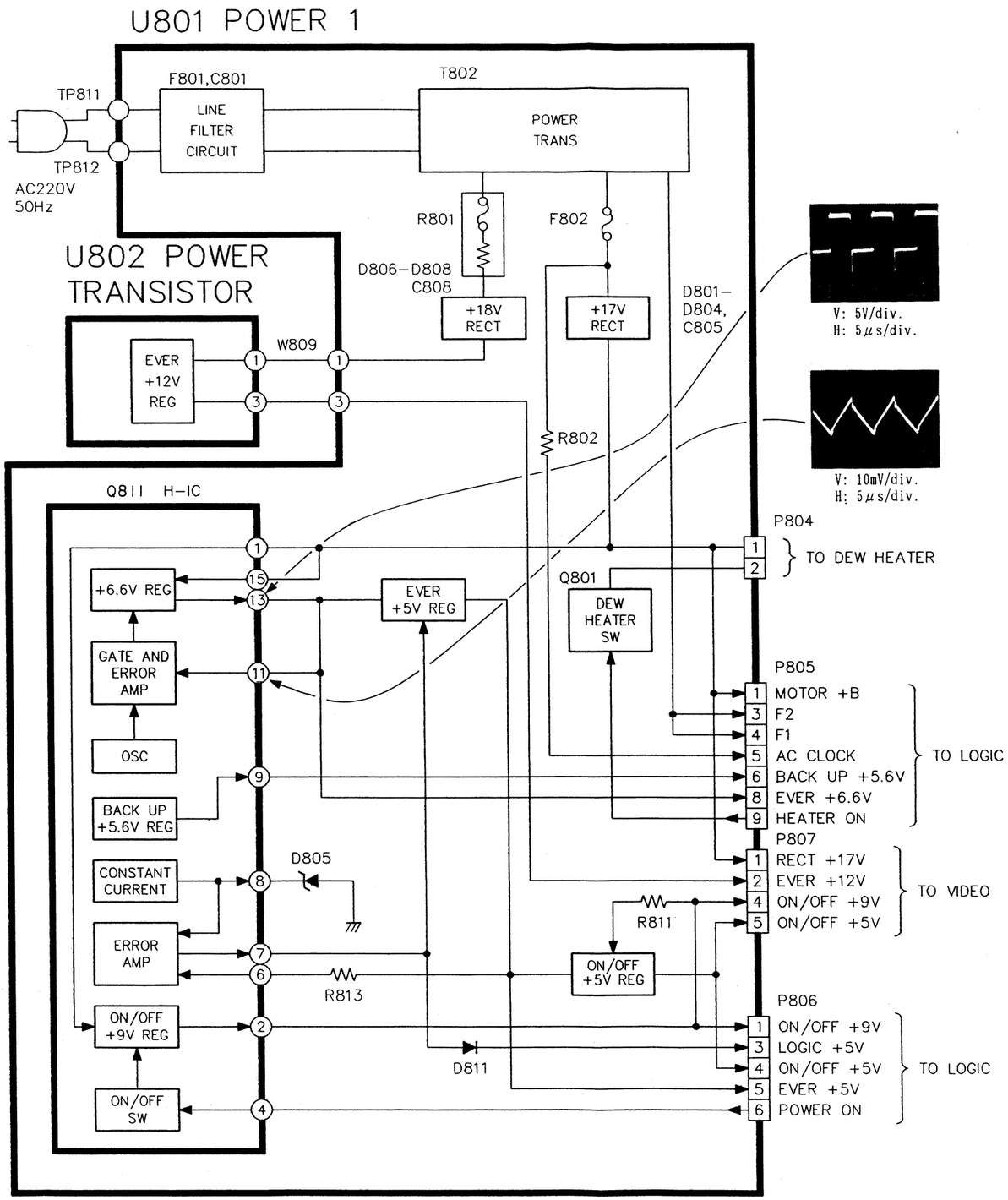
Note: When checking P506, Patch Cord (SN: 70909331) is necessary.
*1: (V-209F/259F/269F/490F)



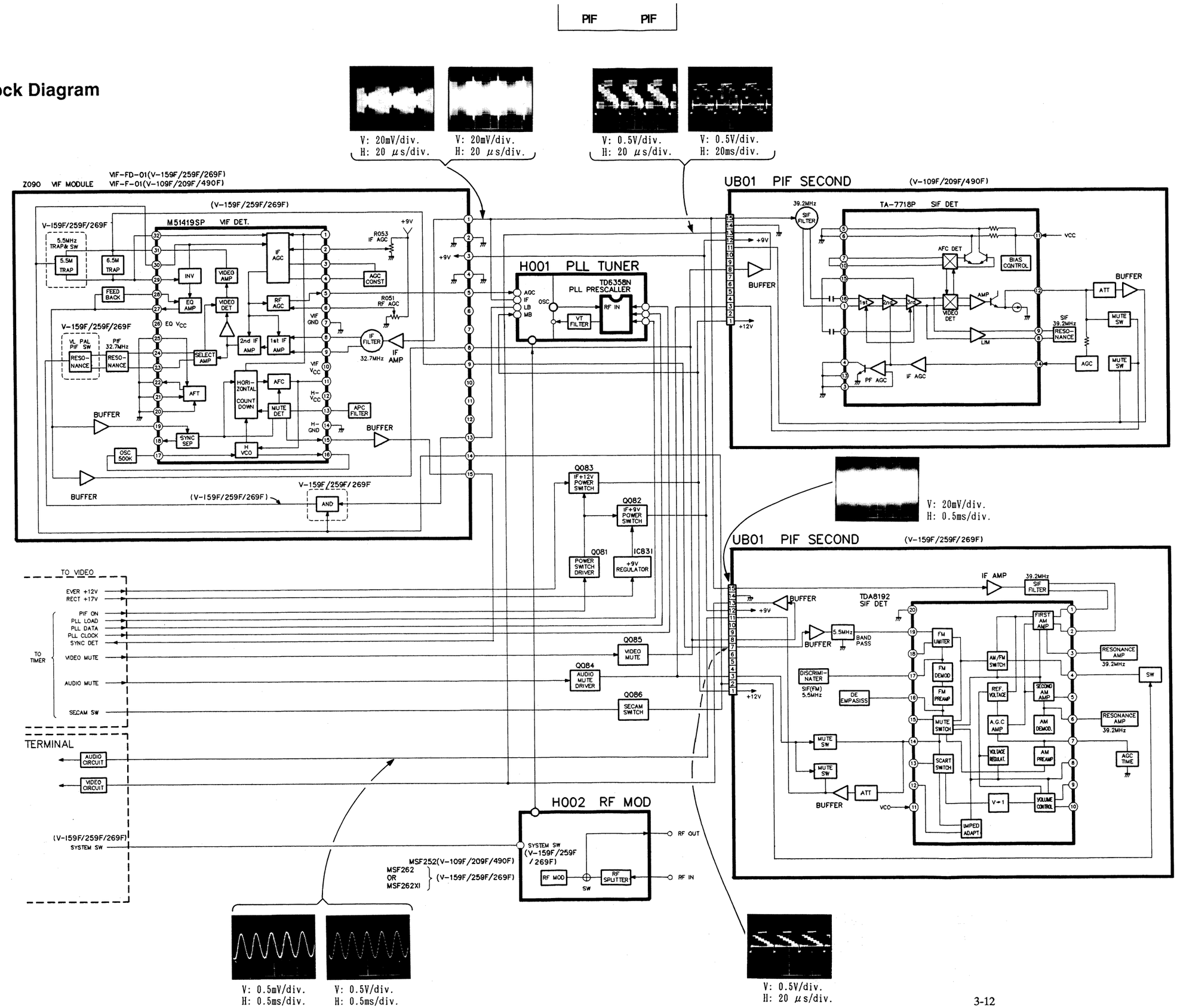


Note: When checking P506, Patch Cord (SN: 70909331) is necessary.
*1 : (V-209F/259F/269F/490F)

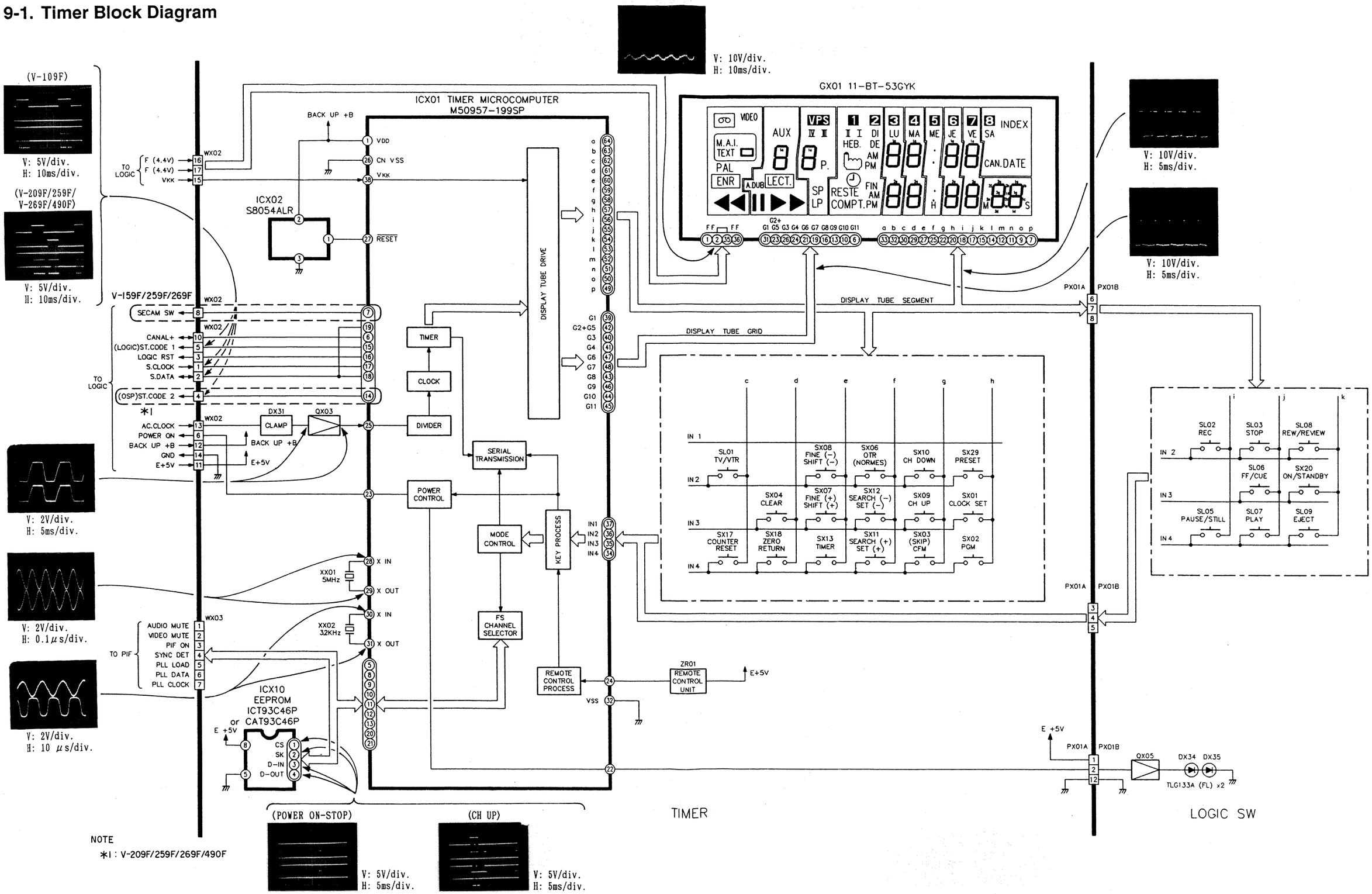
7-1. Power Supply Block Diagram



8-1. PIF Block Diagram



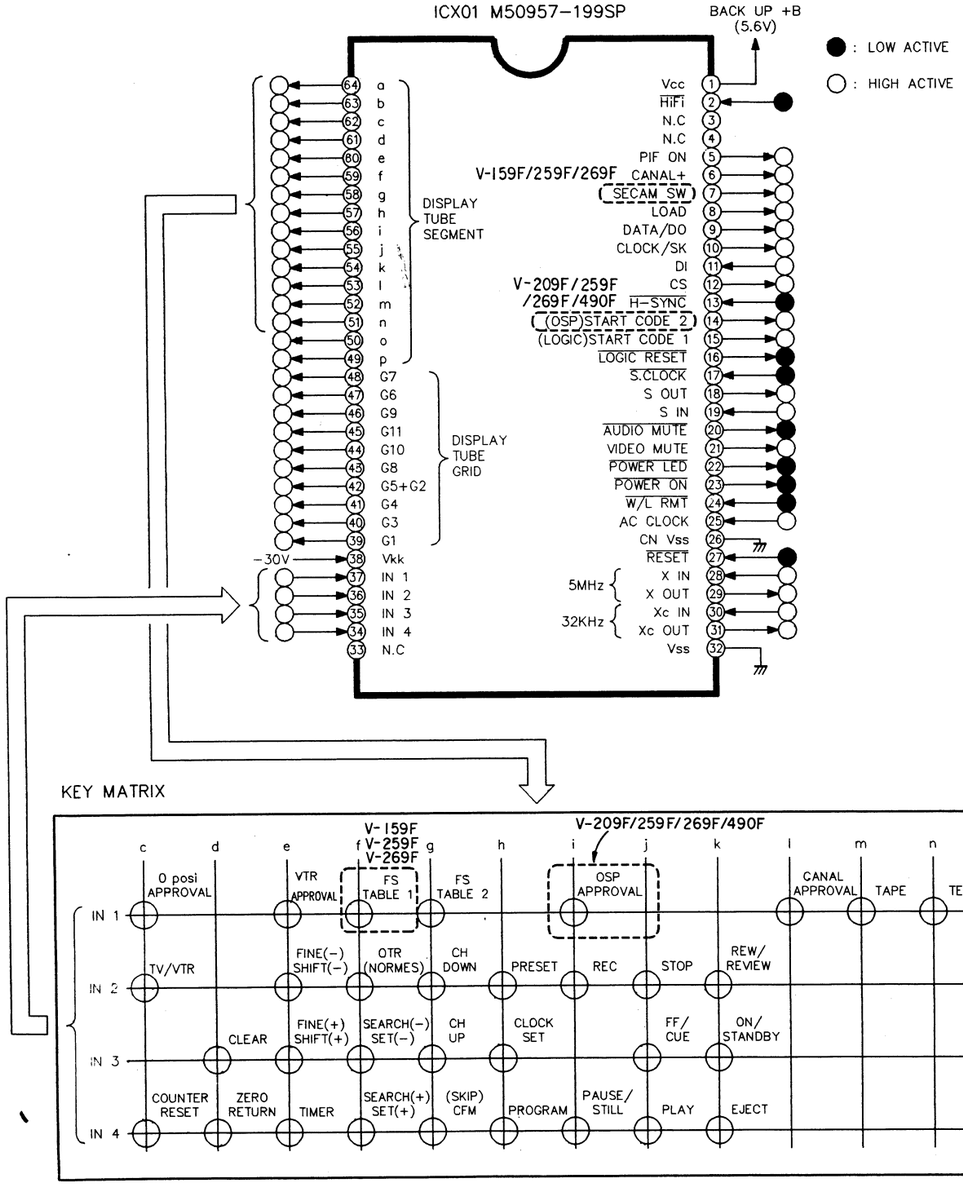
9-1. Timer Block Diagram



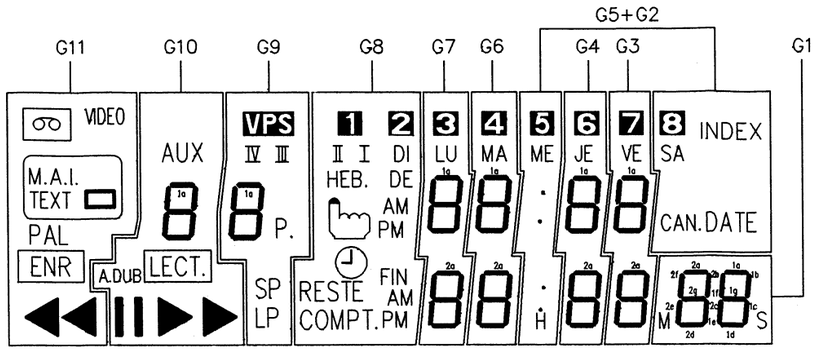
TIMER

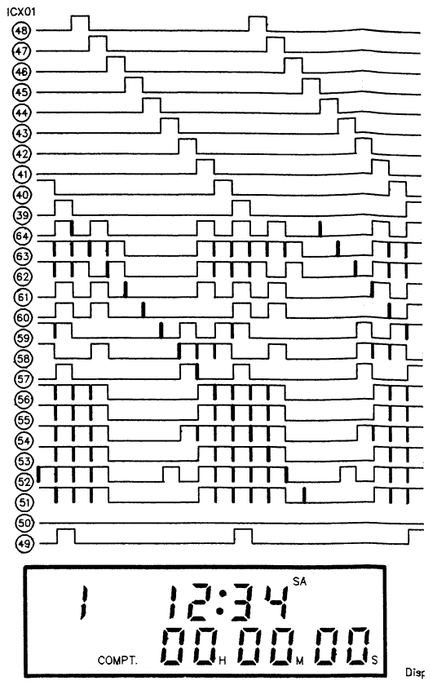
LOGIC SW

Timer Microcomputer Terminal Function



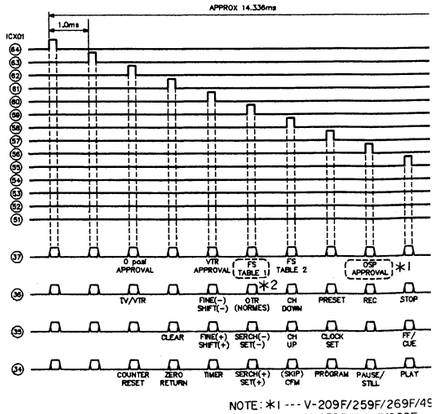
Timer Display



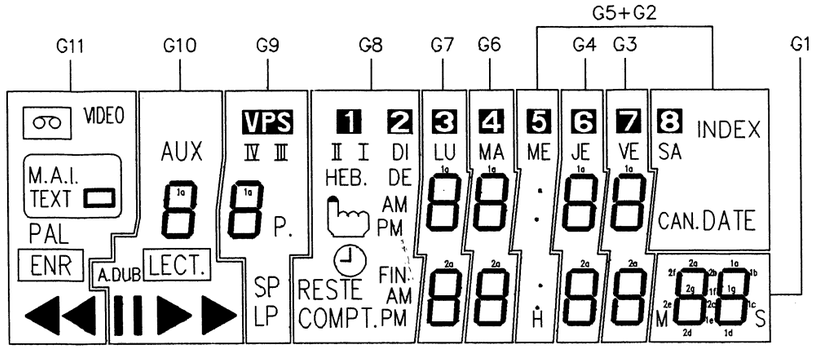


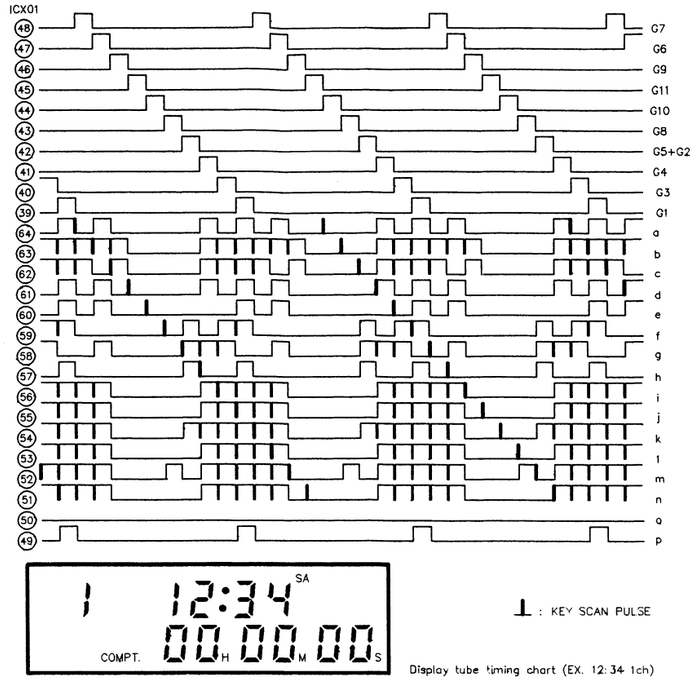
Timer Display Pattern

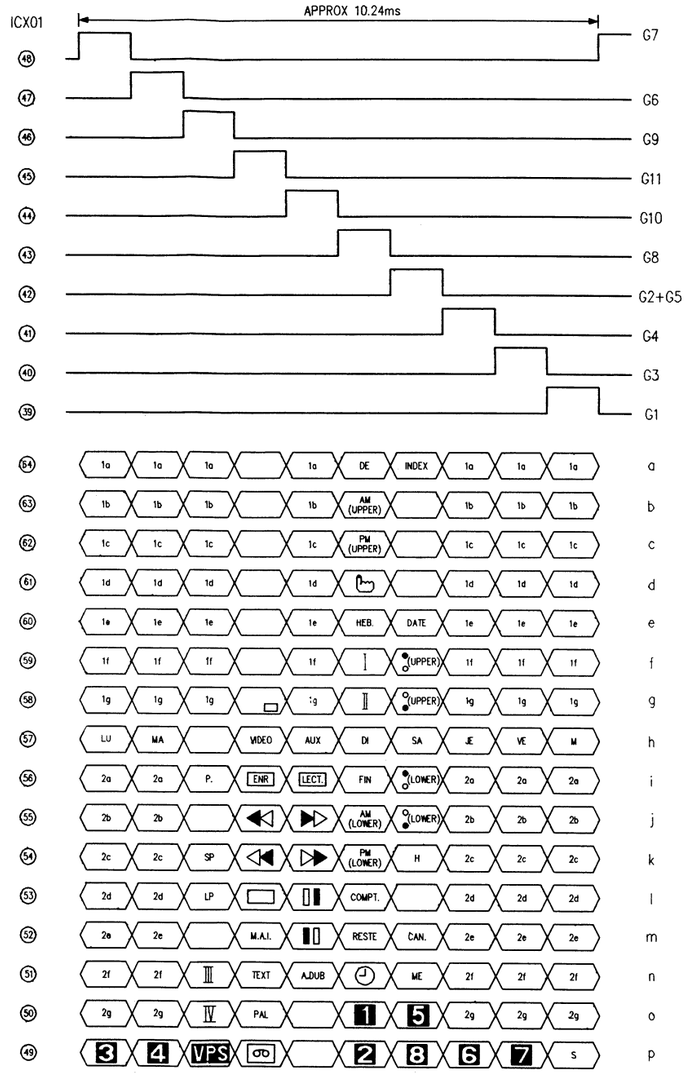
	G11	G10	G9	G8	G7	G6	G4	G3	G2+G5	G1
a		1a	1a	DE	1a	1a	1a	1a	INDEX	1a
b		1b	1b	AM(UPPER)	1b	1b	1b	1b		1b
c		1c	1c	PM(UPPER)	1c	1c	1c	1c		1c
d		1d	1d		1d	1d	1d	1d		1d
e		1e	1e	HEB.	1e	1e	1e	1e	DATE	1e
f		1f	1f	I	1f	1f	1f	1f	●(UPPER)	1f
g	▭	1g	1g	II	1g	1g	1g	1g	○(UPPER)	1g
h	VIDEO	AUX		DI	LU	MA	JE	VE	SA	M
i	ENR	LECT.	P.	FIN	2a	2a	2a	2a	●(LOWER)	2a
j	◀◀	▶▶		AM(LOWER)	2b	2b	2b	2b	○(LOWER)	2b
k	◀▮	▮▶	SP	PM(LOWER)	2c	2c	2c	2c	H	2c
l	▭	▯▮	LP	COMPT.	2d	2d	2d	2d		2d
m	M.A.I.	▮▯		RESTE	2e	2e	2e	2e	CAN.	2e
n	TEXT	A.DUB	III	🕘	2f	2f	2f	2f	ME	2f
o	PAL		IV	1	2g	2g	2g	2g	5	2g
p	📼		VPS	2	3	4	6	7	8	S



Timer Display

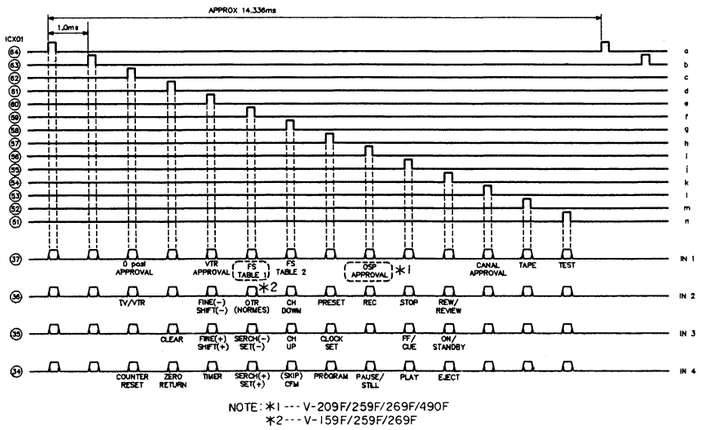






Timer Display Pattern

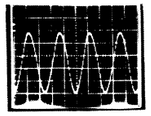
	G11	G10	G9	G8	G7	G6	G4	G3	G2+G5	G1
a		1a	1a	DE	1a	1a	1a	1a	INDEX	1a
b		1b	1b	AM(UPPER)	1b	1b	1b	1b		1b
c		1c	1c	PM(UPPER)	1c	1c	1c	1c		1c
d		1d	1d		1d	1d	1d	1d		1d
e		1e	1e	HEB.	1e	1e	1e	1e	DATE	1e
f		1f	1f	I	1f	1f	1f	1f	●(UPPER) ○	1f
g	▭	1g	1g	II	1g	1g	1g	1g	○(UPPER) ●	1g
h	VIDEO	AUX		DI	LU	MA	JE	VE	SA	M
i	ENR	LECT.	P.	FIN	2a	2a	2a	2a	●(LOWER) ○	2a
j	◀◀	▶▷		AM(LOWER)	2b	2b	2b	2b	○(LOWER) ●	2b
k	◁◀	▷▶	SP	PM(LOWER)	2c	2c	2c	2c	H	2c
l	▭	▮▯	LP	COMPT.	2d	2d	2d	2d		2d
m	M.A.I.	▮▯		RESTE	2e	2e	2e	2e	CAN.	2e
n	TEXT	A.DUB	III	🕘	2f	2f	2f	2f	ME	2f
o	PAL		IV	1	2g	2g	2g	2g	5	2g
p	📼		VPS	2	3	4	6	7	8	S



NOTE: *1 --- V-209F/259F/269F/490F
*2 --- V-159F/259F/269F

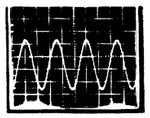
10-1. Logic Block Diagram

① IC601, Pin ㊿



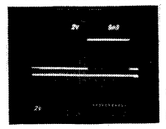
V: 1V/div.
H: 0.1μs/div.

② IC601, Pin ㊿①



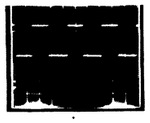
V: 1V/div.
H: 0.1μs/div.

③ a: IC601, Pin ㊽
b: IC601, Pin ㊾



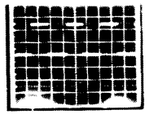
V: 2V/div.
H: 5ms/div.

④ IC601, Pin ㊹



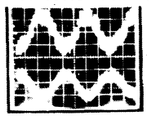
V: 2V/div.
H: 0.2 s/div.

⑤ IC601, Pin ㊼



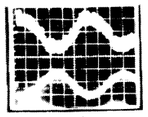
V: 2V/div.
H: 0.2s/div.

⑥ a: IC162, Pin ③
b: IC162, Pin ②



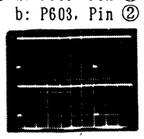
V: 20mV/div.
H: 0.1s/div.

⑦ a: IC162, Pin ⑤
b: IC162, Pin ⑥



V: 20mV/div.
H: 0.1s/div.

⑧ a: P603, Pin ①
b: P603, Pin ②



V: 2V/div.
H: 100μs/div.

⑨ a: IC601, Pin ③
b: IC601, Pin ④

V: 2V/div.
H: 100μs/div.

UL01 LOGIC SW
UX01 TIMER

U601 LOGIC

UI08 LOADING MOTOR RELAY

POWER

TIMER BACK-UP

ICX01 M50957-199SP TIMER

IC601 TMP47C860N-2084 (Z)

SERIAL TRANSMISSION
KEY, REMOTE CONTROL INPUT DATA
TIMER REC, TAPE SPEED, COUNTER KEY
INPUT DATA, CASSETTE DETECT DATA
REMAIN KEY INPUT DATA
SLOW TRACKING, POWER ON/OFF

MODE DATA, COUNTER DATA
POWER ON/OFF
CASSETTE DETECT DATA, DEW
REMAIN DATA, PLAY +B ON/OFF
TAPE SPEED (PLAY), DISPLAY

IC605
PST523D
RESET IC

IC501 SERVO IC

IC604 TA75393P

IC603
TA7291P
DRIVER

IC601 TD6372N-E2
SERVO IC

IC502 NJ2902N

IC503
TA75393S

IC504
TA75902P

IC161 TC4021BP
PARALLEL-SERIAL CONVERSION

UI05
MECHA
BASE

IC162
TA75393P
COMPARATER

DRIVER

DISPLAY

OUTPUT PROCESS

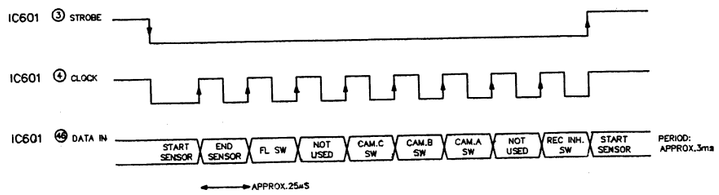
INPUT PROCESS

SERIAL

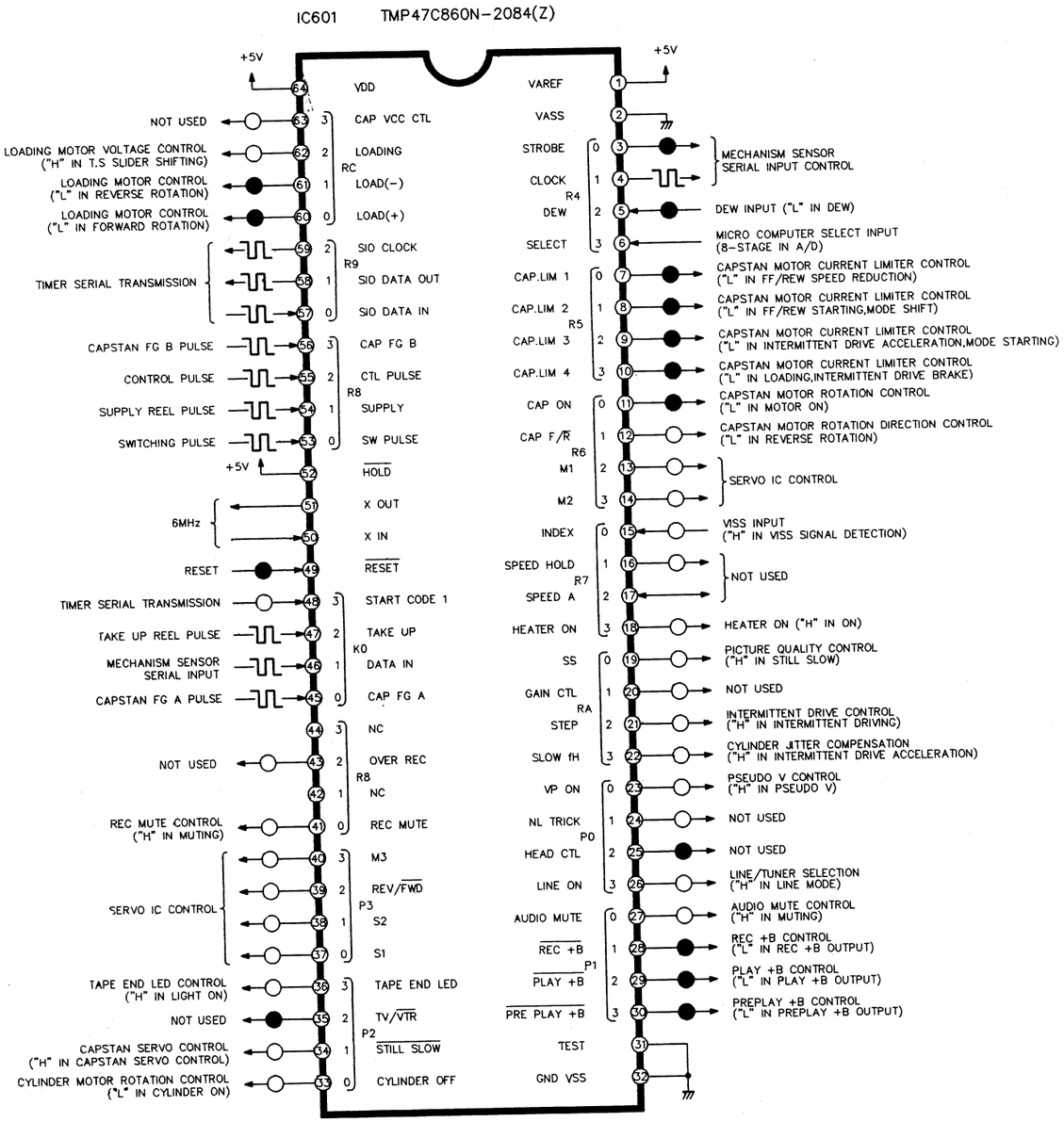
FS
CHANNEL
SELECTOR

V-159F
V-259F
V-269F

Serial Transmission



Logic Microcomputer Terminal Function



DIRECTION	DATA	
TIMER ⟶ LOGIC	POWER ON/OFF	TIMER 1
	REC SPEED	TIMER 1
	REMAIN MODE	TIMER 1
	COUNTER RESET	TIMER 1
	E−180/E−240 SELECTION	TIMER 1
	KEY AND REMOTE CONTROL INPUT	TIMER 2
	COUNTER +/−	TIMER 2
	TV/VTR	TIMER 2
	COUNTER (BACK−UP)	TIMER 3,4,5
	CASSETTE DISTINCTION DATA	TIMER 3
	SLOW TRACKING	TIMER 4
	INDEX KEY DATA	TIMER 5
LOGIC ⟶ TIMER	MARK DISPLAY	LOGIC 1
	REC INHIBIT	LOGIC 1
	REC SPEED (PLAY)	LOGIC 1
	COUNTER +/−	LOGIC 1
	DEW	LOGIC 1
	MODE DATA	LOGIC 2
	REMAIN COUNTING	LOGIC 2
	POWER ON/OFF REQUIRE	LOGIC 2
	COUNTER	LOGIC 3,4,5
	CASSETTE DISTINCTION REMAIN	LOGIC 3,4,5
	INDEX MODE DATA	LOGIC 5

IC601 (TMP47C860N-2084(Z)) Output Polarity

PIN NO.	MODE	ACTIVE	SLOT IN	SLOT OUT	LOADING	UNLOADING	STOP	FF	REW	CUE	REV
7	CAP LIM1	L	H	H	H	H	H	H/L①	H/L①	H	H
8	CAP LIM2	L	L/H	H	H/L	L	H	L/H	L/H	H	H
9	CAP LIM3	L	H	H	H/L	H	H	H	H	② L/H	② L/H
10	CAP LIM4	L	H	H	H	H/L	H	H	H	H	H
11	CAP ON	L	L	L	H/L	H/L	H	L	L	L	L
12	CAP F/R	H	H	L	H	L	H	H	L	H	L
13	M1	H	H	H	H	H	H	L	L	H	H
14	M2	H	H	H	H	H	H	H	H	H	H
16	SPEED HOLD	H	H	H	H	H	H	H	H	L	L
17	SPEED A	−	H	H	H	H	H	H	H	H	H
18	HEATER ON	H	L/H	L/H	L	L	H/L	L	L	L	L
19	SS	H	L	L	L	L	L	L	L	L	L
20	GAIN CTL	H	H	H	H	H	H	H	H	H	H
21	STEP	H	L	L	L	L	L	L	L	L	L
22	SLOW FH	H	L	L	L	L	L	L	L	L	L
23	VP ON	H	L	L	L	L	L	L	L	H	H
24	NL TRICK	H	L	L	L	L	L	L	L	H	H
25	HEAD CTL	L	H	H	H	H	H	H	H	H	H
26	LINE ON	H									
27	AUDIO MUTE	H	L	L	L	L	L	L	L	H	H
28	REC+B	L	H	H	H/L	H	H	H	H	H	H
29	PB+B	L	H	H	H	H	H	H	H	L	L
30	PREPB+B	L	H/L	H	H/L	H	H	H	H	L	L
33	CYLINDER OFF	H	H	H	L	L/H	H/L	L	L	L	L
34	STILL SLOW	H	L/H	L/H	L/H	H/L	L	H/L	H/L	H	H
35	TV/VTR	L								$\overline{3}$	$\overline{3}$
36	T.END LED	H	H	H	H	H	H	H	H	H	H
37	S1	H	L/H	L	L	H/L	L	L/H	L/H	L	L
38	S2	H	H/L	H	L	H/L	L	L/H	L/H	H	H
39	R/F	H	L	L	L	L	L	L	L	L	H
40	M3	H	H/L	H	L	H/L	L	H	H	H	H
41	REC MUTE (V)	H	H	H	H	H	H	H	H	H	H
42	NC	−	H	H	H	H	H	H	H	H	H
43	OVER REC	H	L	L	L	L	L	L	L	L	L
44	NC	−	H	H	H	H	H	H	H	H	H
60	LOAD (+)	L	H	H	L	H	H	H	H	H	H
61	LOAD (−)	L	H	H	H	L	H	H	H	H	H
62	LOADING	H	L	L	H	H	L	L/H	L/H	L	L
63	CAP VCC CTL	H	L	L	L	L	L	L/H	L/H	L	L

DIRECTION	DATA	
TIMER ⟶ LOGIC	POWER ON/OFF	TIMER 1
	REC SPEED	TIMER 1
	REMAIN MODE	TIMER 1
	COUNTER RESET	TIMER 1
	E-180/E-240 SELECTION	TIMER 1
	KEY AND REMOTE CONTROL INPUT	TIMER 2
	COUNTER +/-	TIMER 2
	TV/VTR	TIMER 2
	COUNTER (BACK-UP)	TIMER 3,4,5
	CASSETTE DISTINCTION DATA	TIMER 3
	SLOW TRACKING	TIMER 4
	INDEX KEY DATA	TIMER 5
LOGIC ⟶ TIMER	MARK DISPLAY	LOGIC 1
	REC INHIBIT	LOGIC 1
	REC SPEED (PLAY)	LOGIC 1
	COUNTER +/-	LOGIC 1
	DEW	LOGIC 1
	MODE DATA	LOGIC 2
	REMAIN COUNTING	LOGIC 2
	POWER ON/OFF REQUIRE	LOGIC 2
	COUNTER	LOGIC 3,4,5
	CASSETTE DISTINCTION REMAIN	LOGIC 3,4,5
	INDEX MODE DATA	LOGIC 5

Logic Mode Shift Table

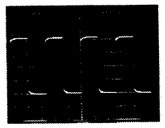
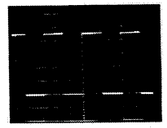
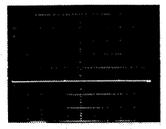
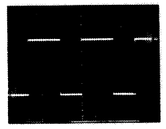
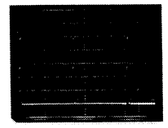
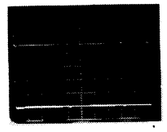
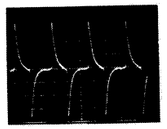
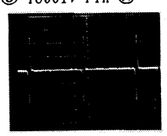
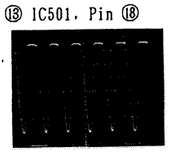
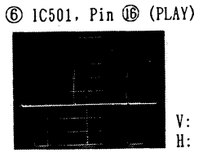
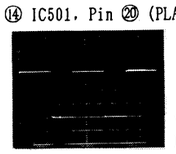
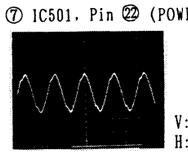
INPUT / CURRENT MODE	EJECT	STOP	REW	FF	PLAY	PAUSE	1/6 SLOW	1/12 SLOW	FRAME	REC	TIMER REC
SLOT IN	○	△	△	△	△	△	△	△	×	×	×
SLOT OUT	—	×	×	×	×	×	×	×	×	×	×
STOP	○	—	○	○	○	×	×	×	×	○ #	○
FF	○	○	○	FF PLAY	○	×	×	×	×	×	○
REW	○	○	REW PLAY	○	○	×	×	×	×	×	○
FF PLAY	○	○	REW PLAY	○	○	×	×	×	×	×	○
REW PLAY	○	○	○	FF PLAY	○	×	×	×	×	×	○
PLAY	○	○	REW PLAY	FF PLAY	—	STILL PICTURE	○	○	×	×	○
STILL PICTURE	○	○	REW PLAY	FF PLAY	×	PLAY	○	○	○ *	REC PAUSE #	○
1/6 SLOW	○	○	REW PLAY	FF PLAY	○	STILL PICTURE	—	○	—	×	○
1/12 SLOW	○	○	REW PLAY	FF PLAY	○	STILL PICTURE	○	—	—	×	○
REC	×	○	×	×	×	REC PAUSE	×	×	×	—	○
REC PAUSE	×	○	×	×	×	REC	×	×	×	×	○
TIMER REC	×	×	×	×	×	×	×	×	×	×	—

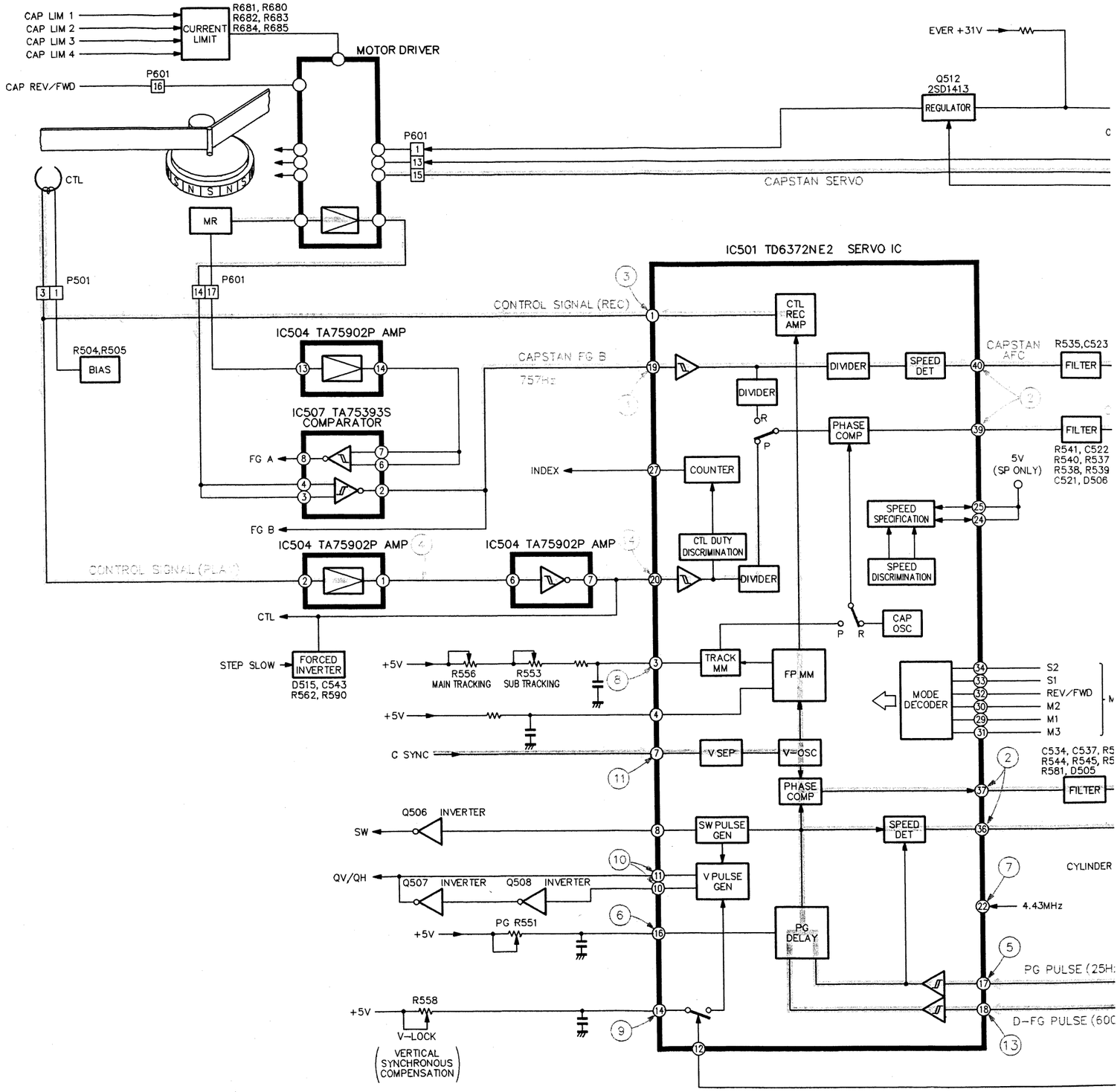
○ · · · SHIFTS TO INPUT MODE DIRECTLY.
△ · · · SHIFTS TO INPUT MODE AFTER SLOT IN IS COMPLETED.
× · · · NO SHIFT.
* · · · WHEN BUTTON IS KEPT PUSHING,BECOMES APPROX. 1/25 SLOW.
\# · · · EJECT WITH REC INHIBIT TAB FOLDED.

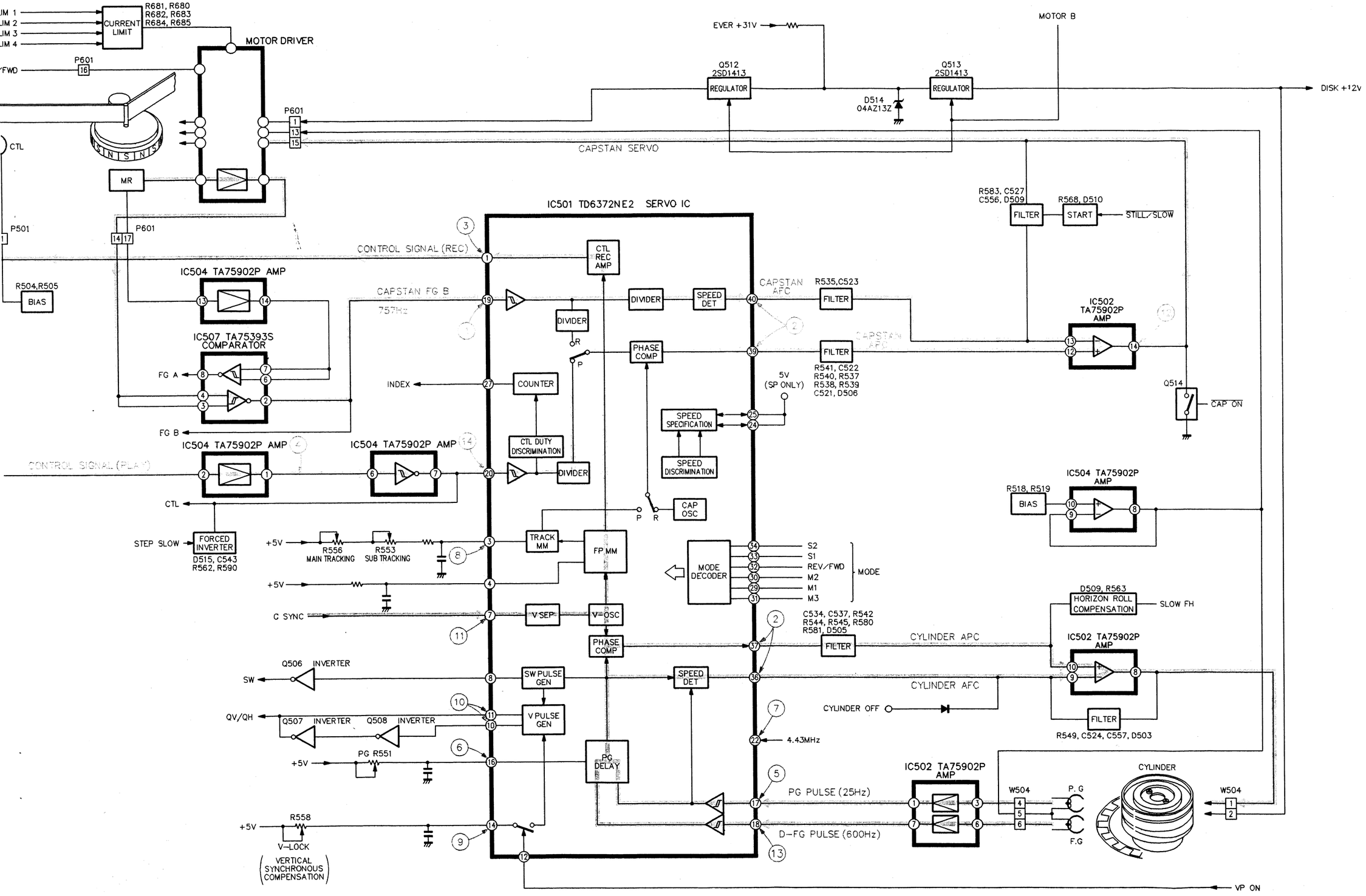
IC601 (TMP47C860N-2084(Z)) Output Polarity

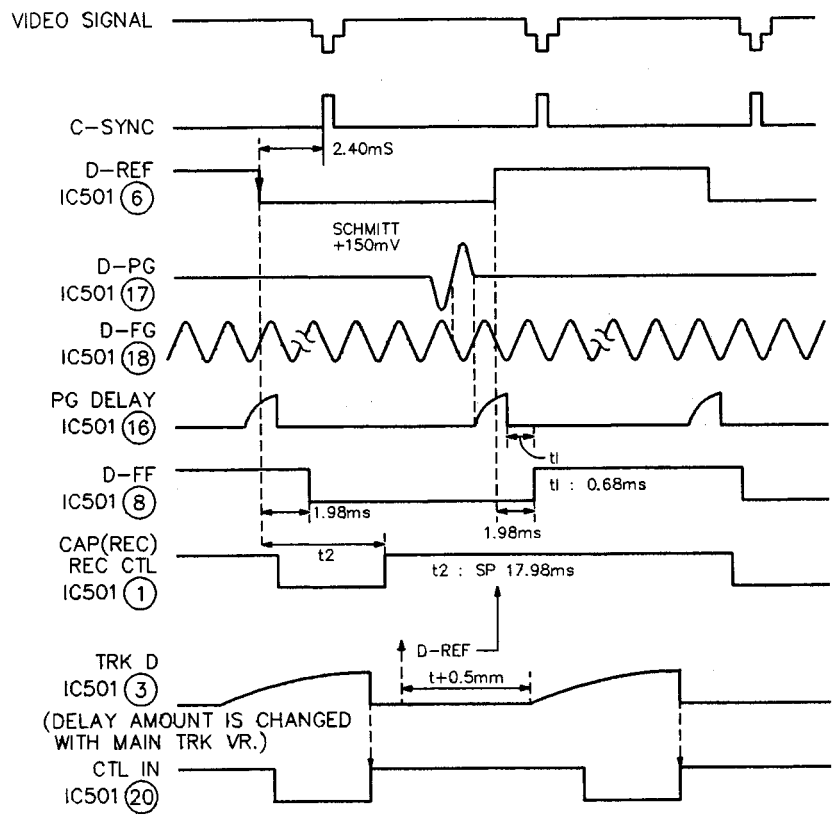
PIN NO.	MODE	ACTIVE	SLOT IN	SLOT OUT	LOADING	UNLOADING	STOP	FF	REW	CUE	REV	PLAY	STILL	SLOW STEP	REC	REC PAUSE	EDITING REWIND	NOTE
7	CAP LIM1	L	H	H	H	H	H	H/L①	H/L①	H	H	H	H	H	H	H	H	① "L" IN SPEED REDUCTION
8	CAP LIM2	L	L/H	H	H/L	L	H	L/H	L/H	H	H	H	L		H	H		② "L" IN ACCELERATION
9	CAP LIM3	L	H	H	H/L	H	H	H	H	② L/H	② L/H	H	H		H	H	H	
10	CAP LIM4	L	H	H	H	H/L	H	H	H	H	H	H	H		H	H		
11	CAP ON	L	L	L	H/L	H/L	H	L	L	L	L	L	H		L	H		
12	CAP F/R	H	H	L	H	L	H	H	L	H	L	H	H		H	H		
13	M1	H	H	H	H	H	H	L	L	H	H	H	H	H	L	L	L	
14	M2	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	
16	SPEED HOLD	H	H	H	H	H	H	H	H	L	L	L	H	H	H	H	H	
17	SPEED A	–	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
18	HEATER ON	H	L/H	L/H	L	L	H/L	L	L	L	L	L	L	L	L	L	L	
19	SS	H	L	L	L	L	L	L	L	L	L	L	H	H	L	L	H	
20	GAIN CTL	H	H	H	H	H	H	H	H	H	H	H	L	L	H	H	H	
21	STEP	H	L	L	L	L	L	L	L	L	L	L	L		L	L	L	
22	SLOW FH	H	L	L	L	L	L	L	L	L	L	L	L		L	L	L	
23	VP ON	H	L	L	L	L	L	L	L	H	H	L	H	H	L	L	L	
24	NL TRICK	H	L	L	L	L	L	L	L	H	H	L		L	L	L	L	
25	HEAD CTL	L	H	H	H	H	H	H	H	H	H	H	L		H	H	H	NO RELATION WITH MODE
26	LINE ON	H																
27	AUDIO MUTE	H	L	L	L	L	L	L	L	H	H	L	H	H	L	L	L	
28	REC+B	L	H	H	H/L	H	H	H	H	H	H	H	H	H	L	L	L/H	
29	PB+B	L	H	H	H	H	H	H	H	L	L	L	L	L	H	H	H	
30	PREPB+B	L	H/L	H	H/L	H	H	H	H	L	L	L	L	L	H	H	H	
33	CYLINDER OFF	H	H	H	L	L/H	H/L	L	L	L	L	L	L	L	L	L	L	
34	STILL SLOW	H	L/H	L/H	L/H	H/L	L	H/L	H/L	H	H	H	L		H	L		
35	TV/VTR	L																
36	T.END LED	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
37	S1	H	L/H	L	L	H/L	L	L/H	L/H	L	L	L	L	L	L	L	L	
38	S2	H	H/L	H	L	H/L	L	L/H	L/H	H	H	L	L	L	L	L	L	
39	R/F	H	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	
40	M3	H	H/L	H	L	H/L	L	H	H	H	H	L	H	H	L (VISS H)	L	L	
41	REC MUTE (V)	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	
42	NC	–	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
43	OVER REC	H	L	L	L	L	L	L	L	L	L	L	L	L		L	L	
44	NC	–	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	
60	LOAD (+)	L	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H	
61	LOAD (–)	L	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	
62	LOADING	H	L	L	H	H	L	L/H	L/H	L	L	L	L	L	L	L	L	
63	CAP VCC CTL	H	L	L	L	L	L	L/H	L/H	L	L	L	L	L	L	L	L	

11-1. Servo Block Diagram

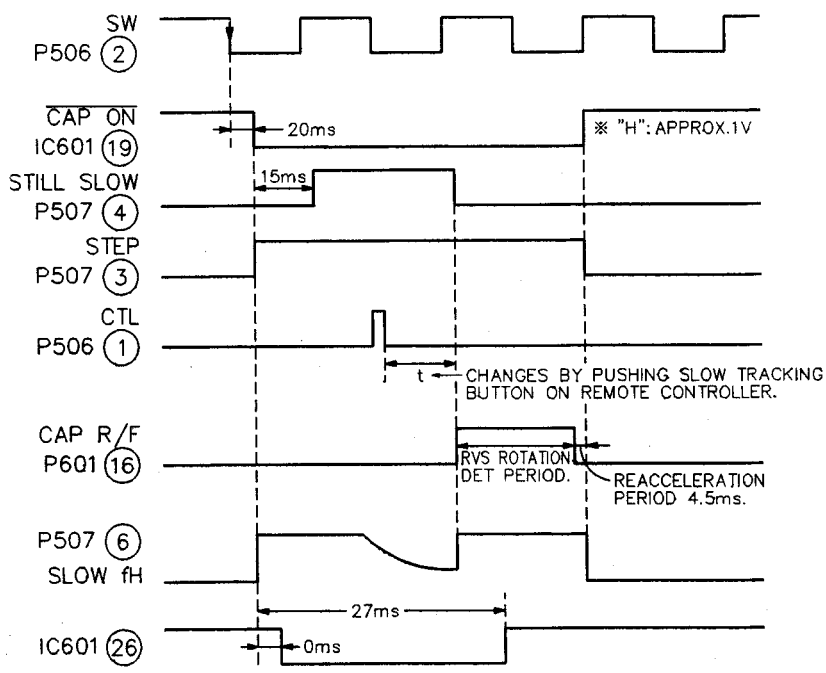
Cylinder Servo	Capstan Servo
① IC501, Pin ⑲  V: 1V/div. H: 0.5ms/div.	⑧ IC501, Pin ③ (PLAY) V: 1V/div. H: 10ms/div.
② IC501, Pin ㊳, ㊵, ㊴, ㊵  V: 1V/div. H: 10 μs/div.	⑨ IC501, Pin ⑭ (STILL)  V: 1V/div. H: 5ms/div.
③ IC501, Pin ①  V: 1V/div. H: 10ms/div.	⑩ IC501, Pin ⑪ (STILL)  V: 1V/div. H: 5ms/div.
④ a: IC504, Pin ① (REC) V: 0.5V/div. H: 10ms/div.	⑪ IC501, Pin ⑦ (EE)  V: 1V/div. H: 5ms/div.
④ b: IC504, Pin ① (CUE)  V: 0.5V/div. H: 2ms/div.	⑫ IC502, Pin ⑭ (SLOW) V: 0.5mV/div. H: 10ms/div.
⑤ IC501, Pin ⑰  V: 0.2V/div. H: 10ms/div.	⑬ IC501, Pin ⑱  V: 0.5V/div. H:1ms/div.
⑥ IC501, Pin ⑯ (PLAY)  V: 1V/div. H: 5ms/div.	⑭ IC501, Pin ⑳ (PLAY)  V: 1V/div. H: 10ms/div.
⑦ IC501, Pin ㉒ (POWER ON)  V: 0.1V/div/ H: 0.1μs/div.	




R681, R680
R682, R683
R684, R685
CURRENT LIMIT
MOTOR DRIVER
P601
MR
EVER +31V
Q512 2SD1413
REGULATOR
D514 04AZ13Z
Q513 2SD1413
REGULATOR
MOTOR B
DISK +12v
CAPSTAN SERVO
IC501 TD6372NE2 SERVO IC
CONTROL SIGNAL (REC)
CTL REC AMP
IC504 TA75902P AMP
BIAS
R504,R505
CAPSTAN FG B
757Hz
DIVIDER
SPEED DET
CAPSTAN AFC
R535,C523
FILTER
IC507 TA75393S COMPARATOR
FG A
FG B
PHASE COMP
INDEX
COUNTER
5V (SP ONLY)
R541, C522
R540, R537
R538, R539
C521, D506
SPEED SPECIFICATION
SPEED DISCRIMINATION
CTL DUTY DISCRIMINATION
CONTROL SIGNAL (PLAY)
CAP OSC
TRACK MM
FP MM
MODE DECODER
S2
S1
REV/FWD
M2
M1
M3
MODE
STEP SLOW
FORCED INVERTER
D515, C543
R562, R590
R556 MAIN TRACKING
R553 SUB TRACKING
+5V
C SYNC
V SEP
V OSC
C534, C537, R542
R544, R545, R580
R581, D505
CYLINDER APC
CYLINDER AFC
CYLINDER OFF
SW
Q506 INVERTER
SW PULSE GEN
SPEED DET
QV/QH
Q507 INVERTER
Q508 INVERTER
V PULSE GEN
4.43MHz
PG R551
PG DELAY
PG PULSE (25Hz)
D-FG PULSE (600Hz)
R558
V-LOCK
VERTICAL SYNCHRONOUS COMPENSATION
R583, C527
C556, D509
R568, D510
START
STILL/SLOW
IC502 TA75902P AMP
Q514
CAP ON
R518, R519
D509, R563
HORIZON ROLL COMPENSATION
SLOW FH
R549, C524, C557, D503
W504
P.G
F.G
CYLINDER
VP ON



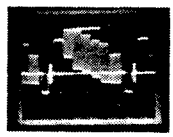
Servo IC Timing Chart



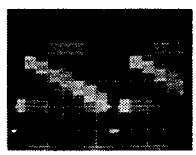
Slow Timing Chart (SP)

Photo. No.㉔ ,㉕ are for V-109F/209F/490F.

① TP201



(PAL REC)
V: 0.2V/div.
H: 10 μs/div.



(SECAM REC)
V:0.2V/div
H:10μs/div.

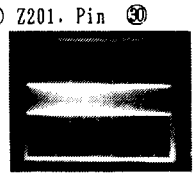
② Z201, Pin ⑧

(PAL REC, SECAM REC)
V: 0.1V/div.
H: 10 μs/div.

③ TP206

(PAL REC, SECAM REC)
V: 0.2V/div.
H: 10 μs/div.

④ Z201, Pin ㉚

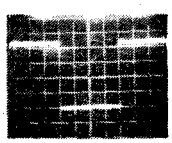


(PAL REC, SECAM REC)
V:0.2V/div
H:10μs/div.

⑤ TP204

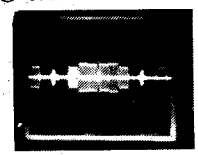
(PAL REC, SECAM REC)
V: 1V/div.
H: 20 μs/div.

⑥ TP103

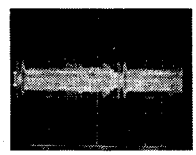


(PAL REC, SECAM REC)
V: 1V/div.
H: 5ms/div.

⑦ TP208



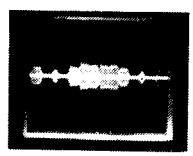
(PAL REC)
V: 0.1V/div.
H: 10 μs/div.



(SECAM REC)
V: 0.1V/div.
H: 10 μs/div.

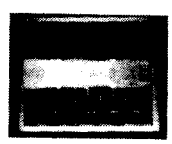
⑧ Z401, Pin ㉚

(PAL REC)
V: 0.05V/div.
H: 10 μs/div.

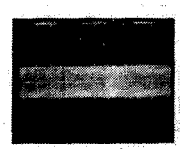


(PAL PLAY)
V: 0.1V/div.
H: 10 μs/div.

⑨ TP101

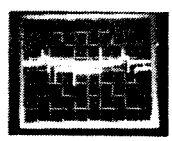


(PAL PLAY)
V: 0.1v/div.
H: 5ms/div.



(SECAM PLAY)
V: 0.2V/div.
H: 10 μs/div.

⑩ Z201, Pin ㉕



(PAL PLAY, SECAM PLAY)
V: 0.2V/div.
H: 10 μs/div.

⑪ TP212

(PAL PLAY, SECAM PLAY)
V: 0.1V/div.
H: 10 μs/div.

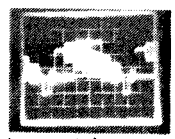
⑫ TP213

(PAL PLAY, SECAM PLAY)
V: 0.1V/div.
H: 10 μs/div.

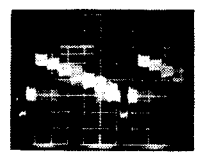
⑬ Z201, Pin ⑤

(PAL , SECAM PLAY)
V: 0.2V/div.
H: 10 μs/div.

⑭ Z201, Pin ⑥



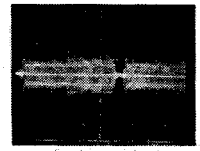
(PAL PLAY)
V: 0.5V/div.
H: 10 μs/div.



(SECAM PLAY)
V: 0.5V/div.
H: 10 μs/div.

⑮ Z201, Pin ②

(PAL PLAY)
V: 0.1V/div.
H: 10 μs/div.



(SECAM PLAY)
V: 0.1v/div.
H: 10 μs/div.

⑯ Z401, Pin ㉝

(PAL PLAY)
V: 0.02V/div.
H: 10 μs/div.

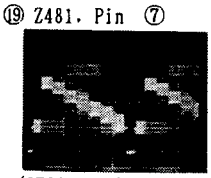
⑰ Z401, Pin ①

(PAL PLAY)
V: 0.1V/div.
H: 0.1μs/div.

⑱ Z401, Pin ③

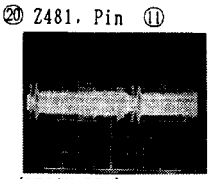
(PAL PLAY)
V: 0.1V/div.
H: 0.1μs/div.

⑲ Z481, Pin ⑦



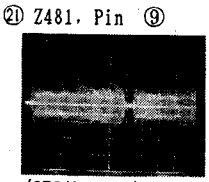
(SECAM REC)
V: 0.2V/div.
H: 10 μs/div.

⑳ Z481, Pin ⑪



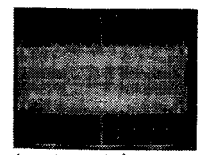
(SECAM REC)
V: 0.1V/div.
H: 10 μs/div.

㉑ Z481, Pin ⑨



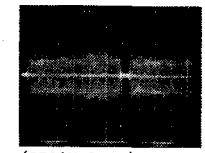
(SECAM PLAY)
V: 0.1V/div.
H: 10 μ/div.

㉒ Z481, Pin ⑭



(SECAM PLAY)
V: 0.2V/div.
H: 2ms/div.

㉓ Z481, Pin ⑰

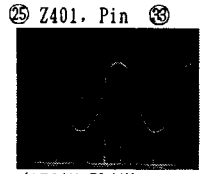


(SECAM PLAY)
V: 0.1V/div.
H: 10 μ/div.

㉔ Z481, Pin ①

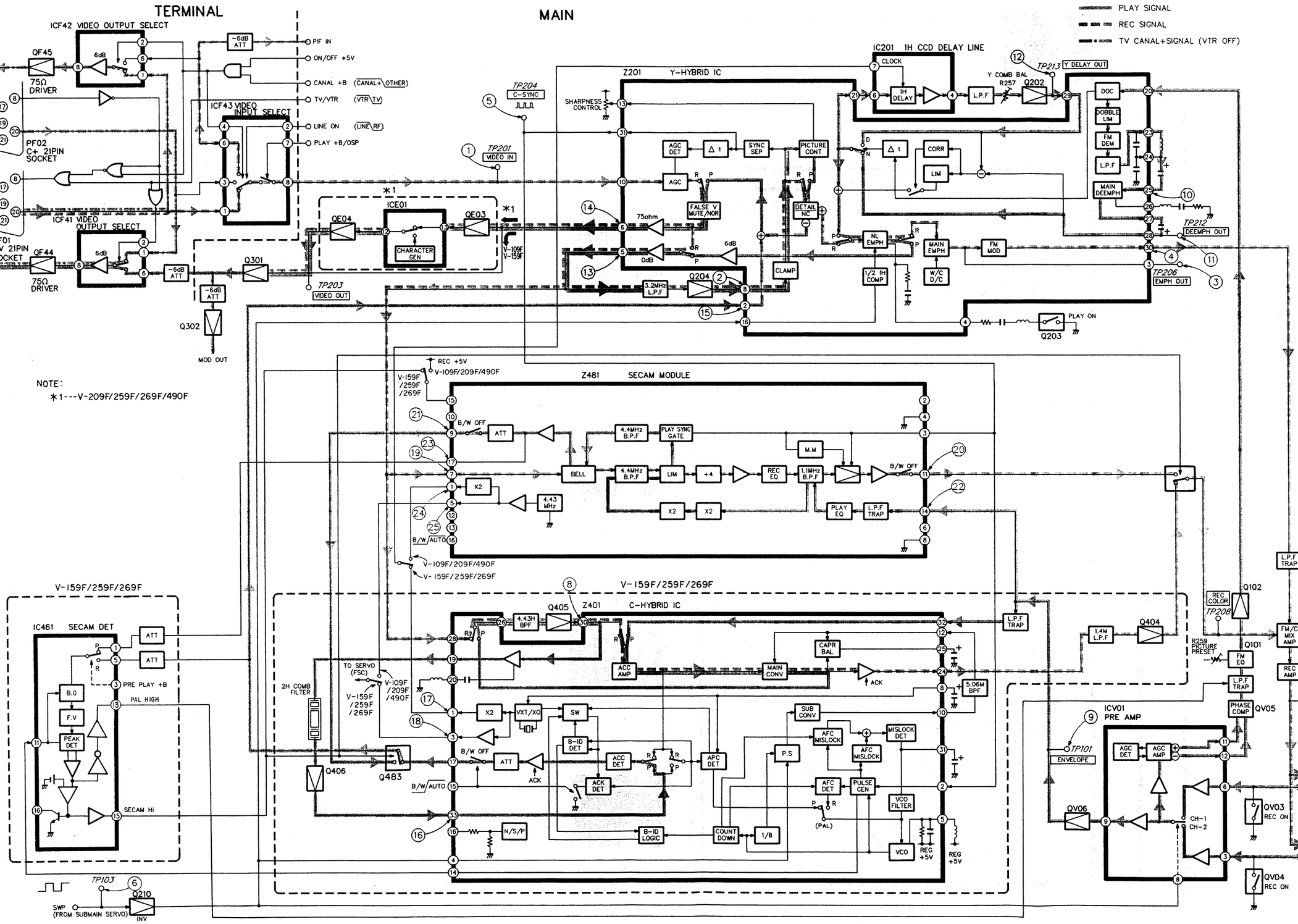
(SECAM PLAY)
V: 0.1V/div.
H: 50ns/div.

㉕ Z401, Pin ㉝

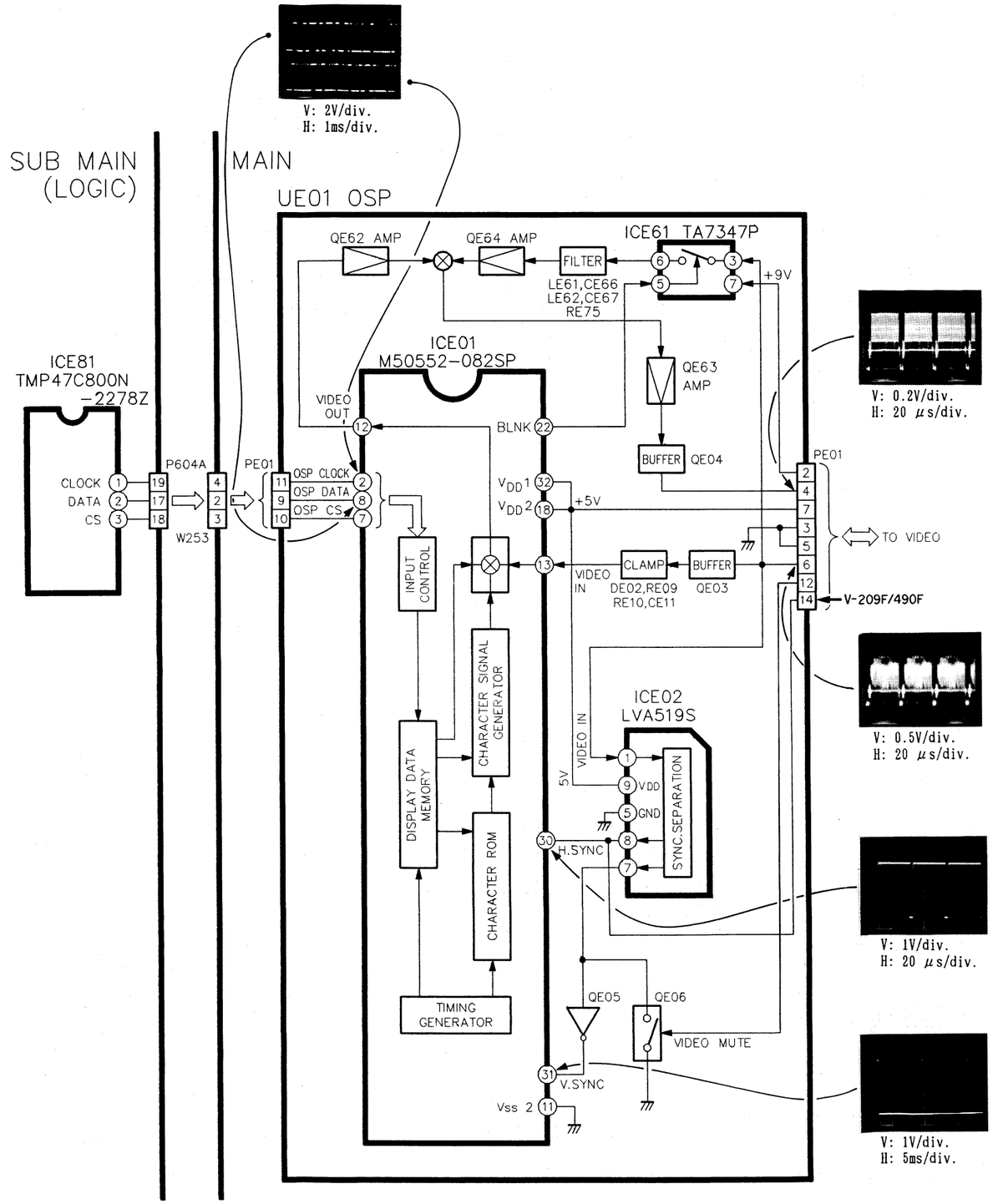


(SECAM PLAY)
V: 0.02V/div.
H: 50ns/div.

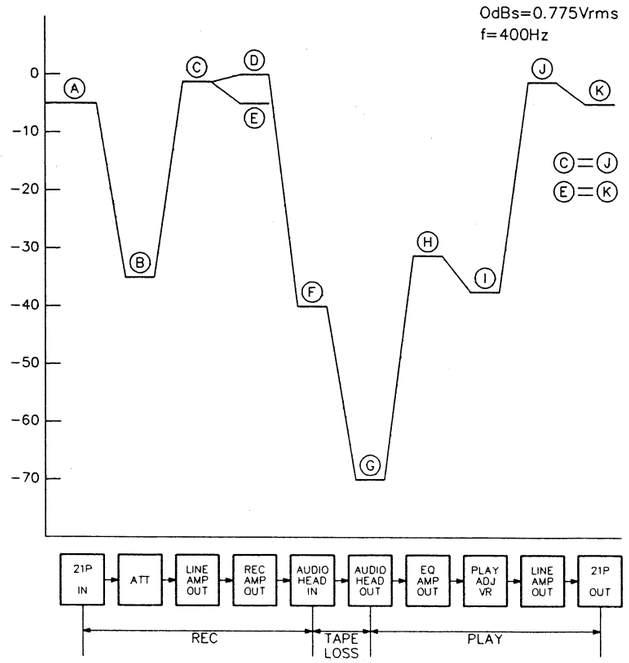
12-1. Video Block Diagram



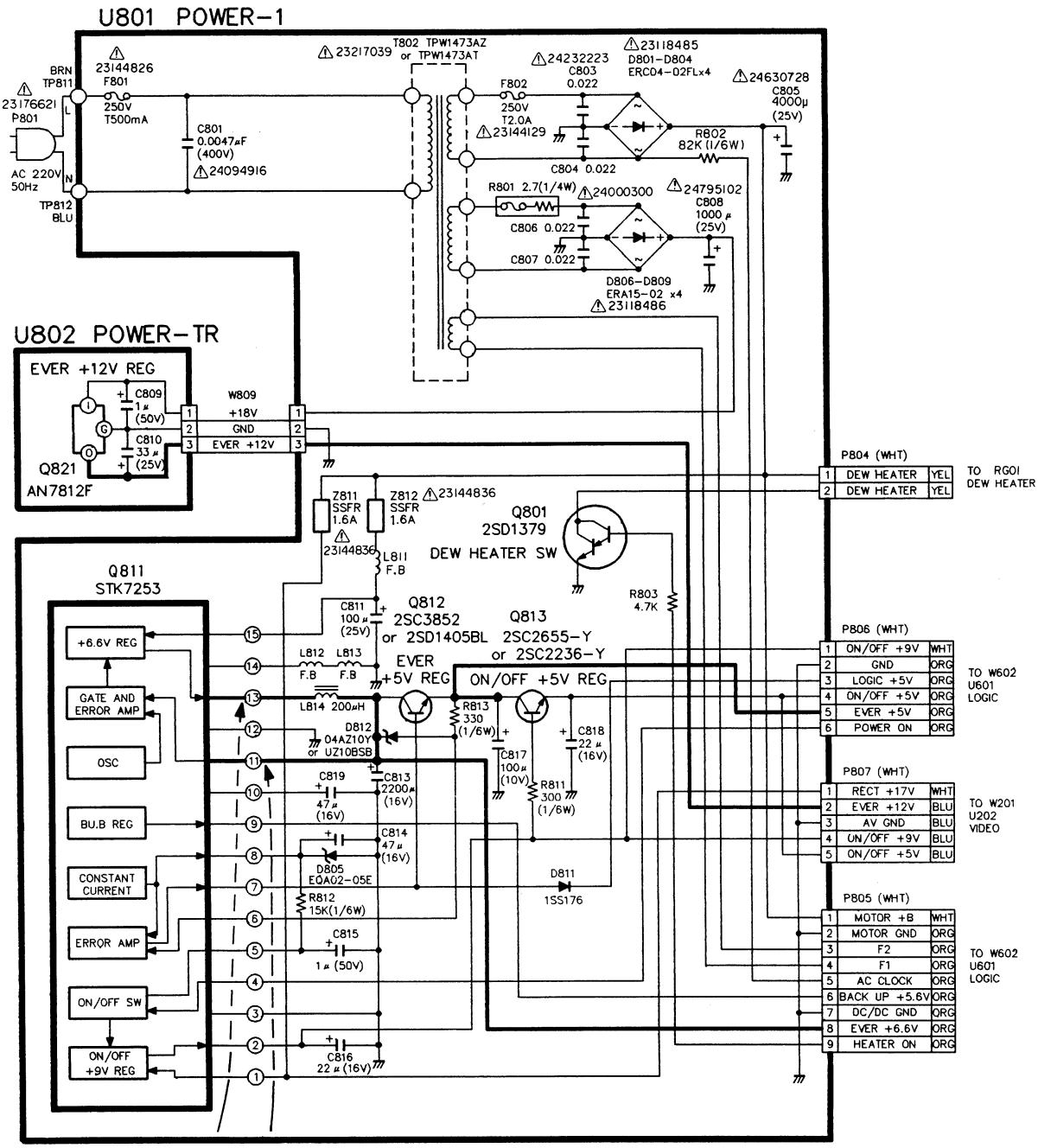
13-1. OSP Block Diagram (V-209F/259F/269F/490F)

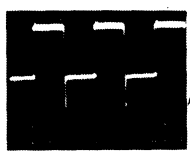


14-1. Audio Block Diagram

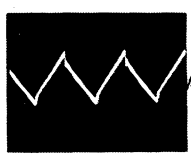


7-3. Power Supply Circuit





V: 5V/div.
H: 5μs/div.



V: 10mV/div.
H: 5μs/div.

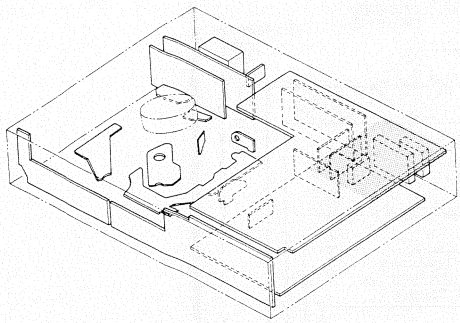
Q811 (V)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S-BY	20.0	0	–	3.5	0	4.9	5.4	4.9	5.5	7.2	6.7	–	6.7	–	20.0
EE	18.5	8.9	–	0	5.7	5.0	5.6	5.0	5.6	7.1	6.6	–	6.6	–	18.5
PLAY	18.0	8.9	–	0	5.7	5.0	5.6	5.0	5.6	7.1	6.6	–	6.6	–	18.0
REC	17.4	8.9	–	0	5.7	5.0	5.6	5.0	5.6	7.1	6.6	–	6.6	–	17.4

(V)

	Q801			Q812			Q813			Q821		
	C	B	E	C	B	E	C	B	E	I	G	O
S-BY	0	1.3	0	6.7	5.4	4.9	4.9	0	4.9	21.5	0	12.0
EE	18.5	0	0	6.6	5.6	5.0	5.0	5.7	5.0	19.0	0	12.0
PLAY	18.0	0	0	6.6	5.6	5.0	5.0	5.7	5.0	20.7	0	12.0
REC	17.4	0	0	6.6	5.6	5.0	5.0	5.7	5.0	18.6	0	12.0

8-2. PIF PC Board



Voltage and Location of Transistors

S: SECAM P: PAL, V :REF (V):PLAY

Symbol No.		Voltage(Unit:V) E	C	B	Location
Q081		0	0.1	0.7	E-5
Q082		9.0	9.0	8.1	F-5
Q083		12	12	11.2	F-5
Q084	MUTE OFF	5.0		5.0	D-5
	MUTE ON	(5.0)	(4.9)	(0.1)	
Q085	MUTE OFF	0		0.1	D-5
	MUTE ON	(0)		(3.5)	
Q086			S: 5.0 P: 0	S: 0 P: 2.1	D-4
QB02		{2.5}	{0}	{1.9}	<B-4> {G-2}
QB03				{1K}	<B-4> {F-2}
QB04		<2.8>	<9.8>	<3.4> {1K}	<A-4> {G-3}
QB05		<10.8> {1.6}	<11.8>	<11.0> {2.3}	<B-3> {G-1}
QB06		{0}	{S: 0} {P: 2.7}	{S: 5.3} {P: 0}	{G-2}
QB07		{3.0}	{8.8}	{3.8}	{F-2}
QB08		{8.8}	{0}	{8.1}	{E-2}
QB12		<3.0>	<8.5>	<3.8>	<B-5>

< > :V-109F/209F/490F

{ } :V-159F/259F/269F

Location of IC

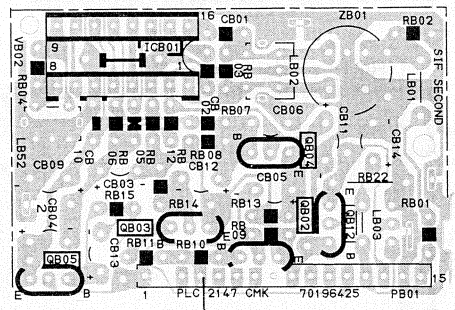
Symbol No.	Location
IC831	G-5
ICB01	<A-4>
QB01	<F-2>

< > :V-109F/209F

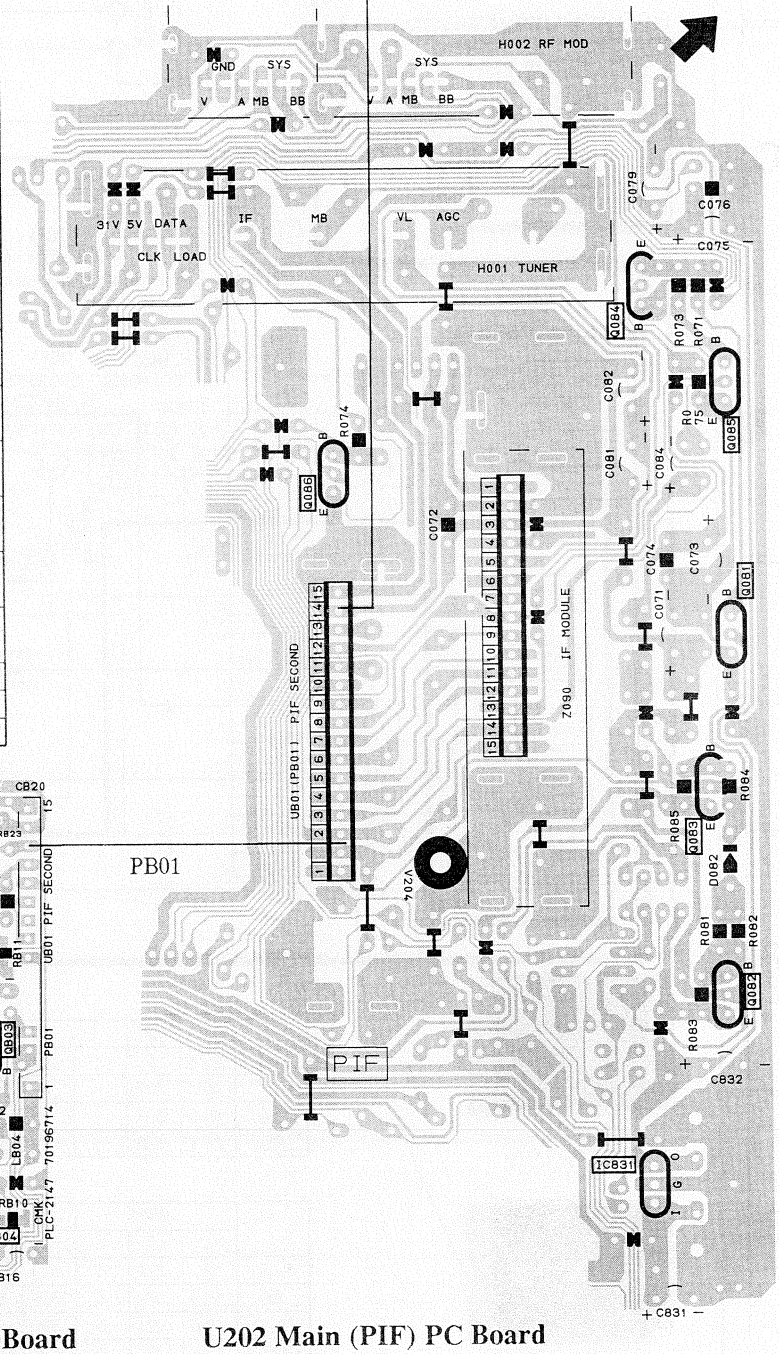
Location of Diodes

Symbol No.	Location
D082	F-5

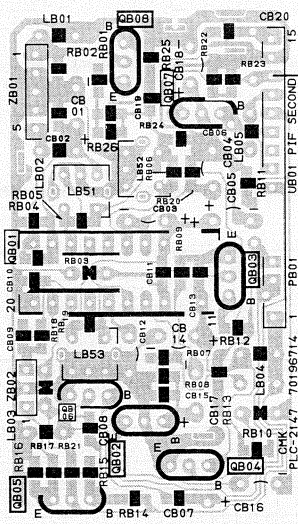
UB01 PIF Second PC Board
(V-109F/209F/490F)



PB01



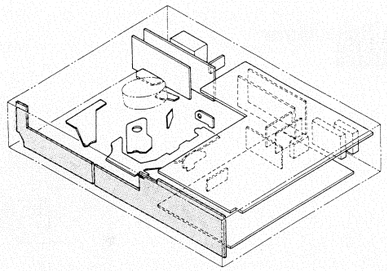
PB01



UV01 PIF Second PC Board
(V-159F/259F/269F)

U202 Main (PIF) PC Board

9-3. Timer PC Board



Voltage and Location of Transistors

Symbol No.	Voltage(Unit:V) E	C	B	Location
QX03	2.1	5.0	2.4	E-10
QX05	4.9	4.8		A-5
QX06				E-6

Location of ICs

Symbol No.	Location
ICX01	E-8
ICX02	E-10
ICX10	D-6

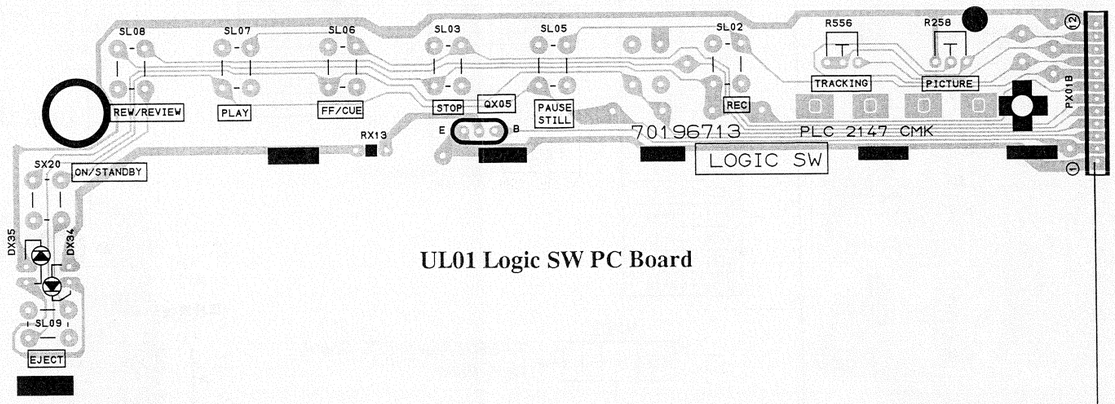
Location of Adjusting VRs

Symbol No.	Location
R258	A-7
R556	A-7

Location of Diodes

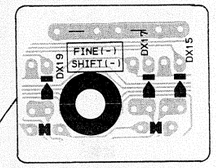
Symbol No.	Location
DX05	E-9
DX06	D-9
DX07	E-9
DX09	D-9
DX10	D-9
DX11	D-9
DX12	{D-9}
DX13	D-9
DX14	D-9
DX15	D-9
DX17	D-8
DX18	[D-8]
DX19	D-8
DX21	D-8
DX24	D-7
DX26	D-7
DX28	E-7
DX31	E-10
DX33	E-10
DX34	B-3
DX35	B-3

( ) :V-259F/269F
[ ] :V-209F/259F/269F/490F
{ } :V-159F/259F/269F



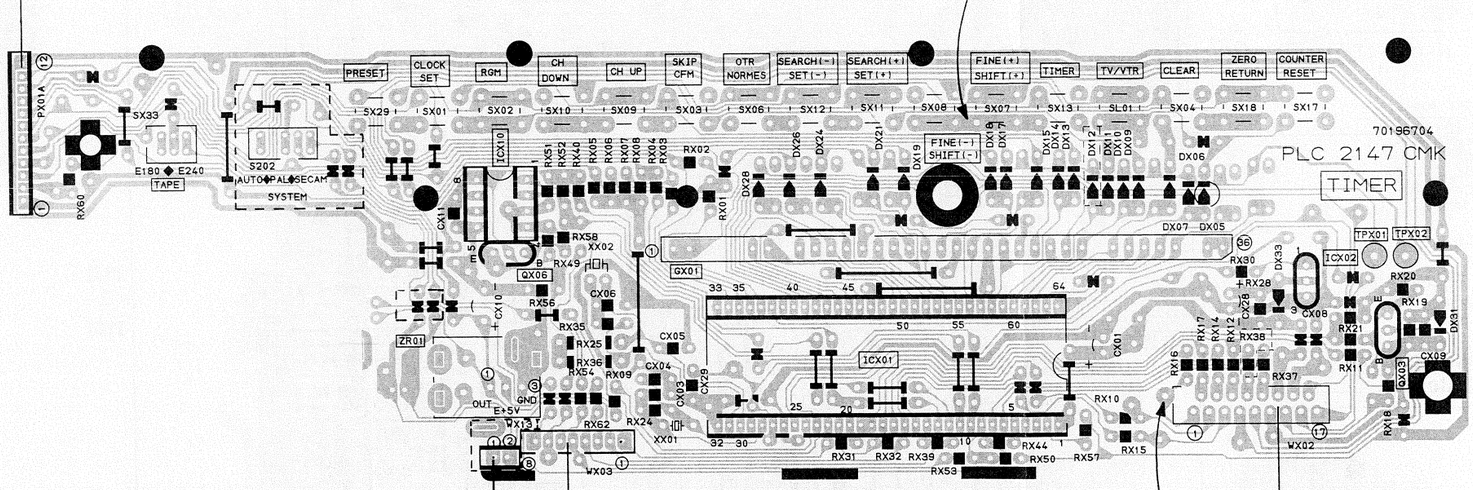
UL01 Logic SW PC Board

PX01A ↔ PX01B



(V-109F/159F)

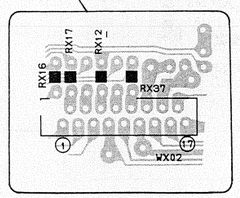
UX01 Timer PC Board



WX02

1	–	17

→ *To U601 Sub Main PC Board, P603*



(V-109F/209F/490F)

WX03

8	–	1

→ *To U202 Main PC Board, P202*

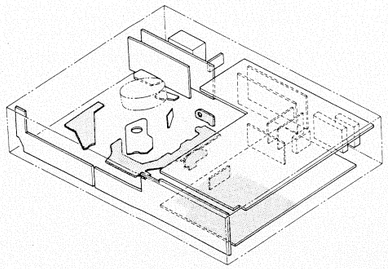
WX13

1	2

← *To U202 Main PC Board, P401 (V-159F/259F/269F)*

[ ] *parts are for V-159F/259F/269F.*

10-2. Logic PC Board



Location of Transistors

Symbol No.	Location
Q614	E-3
Q615	F-3
Q616	F-3
Q617	E-4
Q629	F-6
Q630	E-3
Q633	F-5
Q634	F-4
Q637	F-4
Q121	D-10
Q122	A-11
Q141	F-10
Q151	B-10

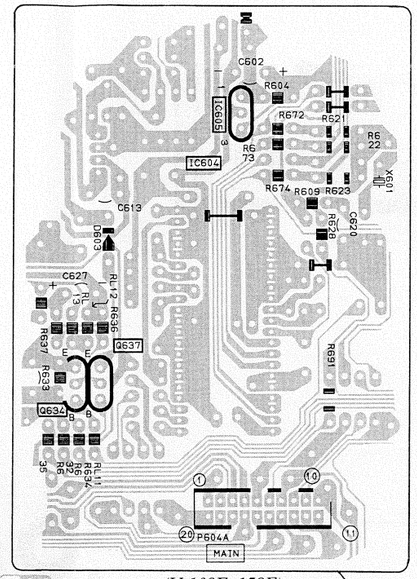
Location of ICs

Symbol No.	Location
IC601	E-6
IC603	E-4
IC604	E-4
IC605	E-4
ICE81	[F-4]
IC161	E-10
IC162	F-10

[ ] : V-209F/259F/269F/490F

Location of Diodes

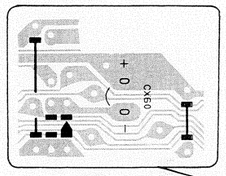
Symbol No.	Location
D081	E-3
D603	E-4
D609	E-4
D161	E-11
DX60	D-3



(V-109F, 159F)

P603
17
|
1

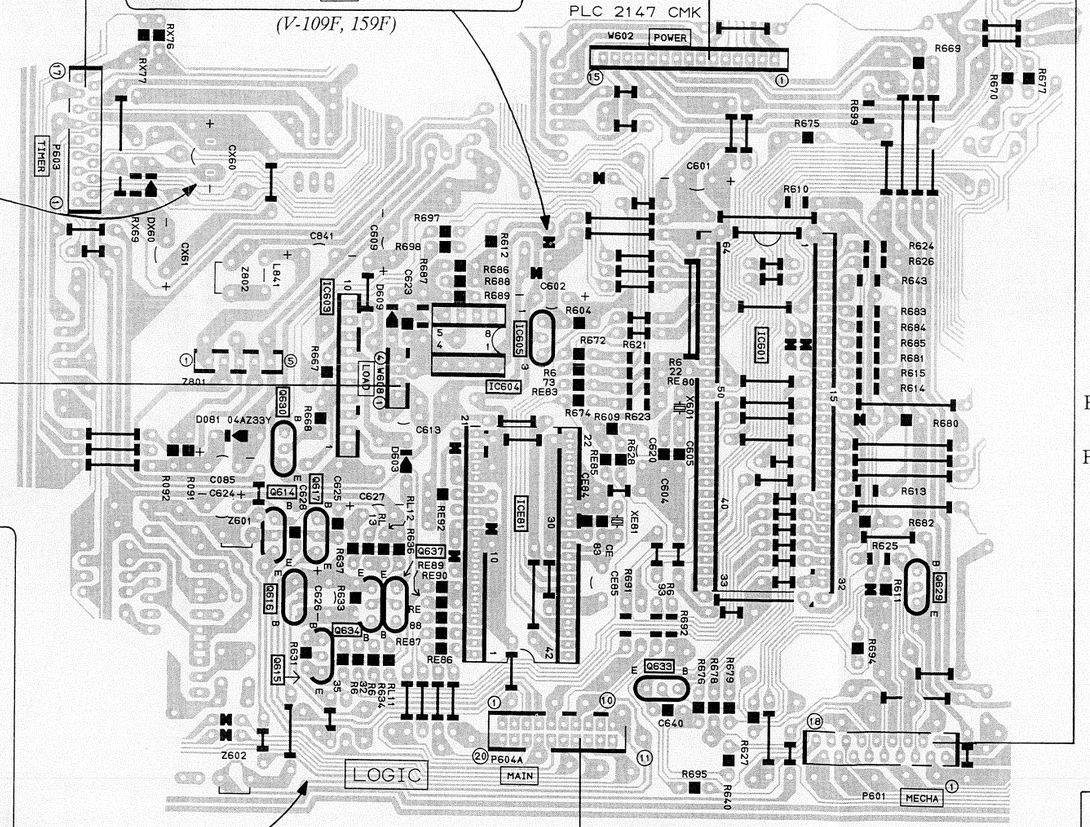
To UX01 Timer PC Board, WX02 ←



(V-109F, 159F)

W602
15 – 1 → To U801 Power 1 PC Board, P805, P806

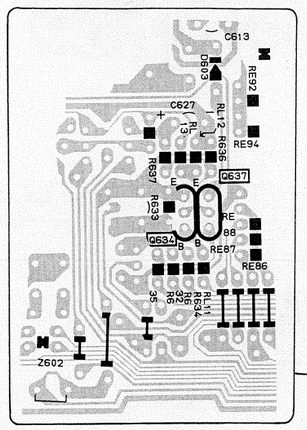
70196699
PLC 2147 CMK



PI81
LOAD MOTOR
GND
DEW SENSOR
TLC-134-T-V-0
PW 7293
7019 6191

PI81 ↕ W608

UI08 Loading Motor PC Board



(V-209F/490F)

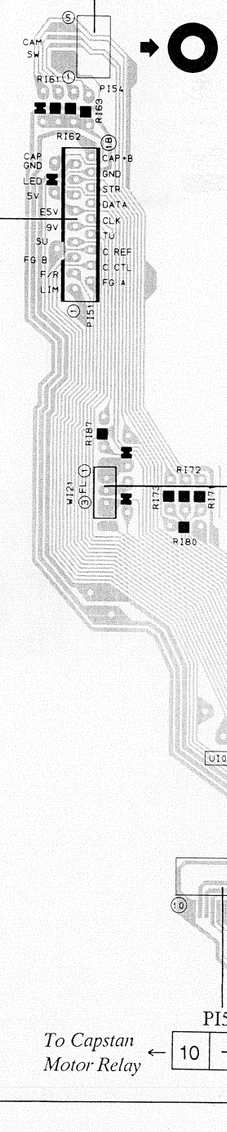
U601 Sub Main (Logic) PC Board

P604A ↔ P604B

parts are for V-209F/259F/269F/490F.

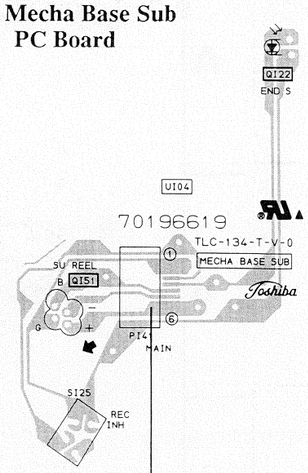
PI54
5
|
1
→ To Cam SW Relay

UI05 Mecha Base Main PC Board

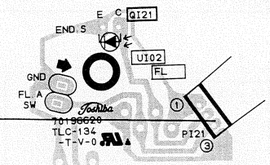


WI21 ↔ PI21

UI04 Mecha Base Sub PC Board

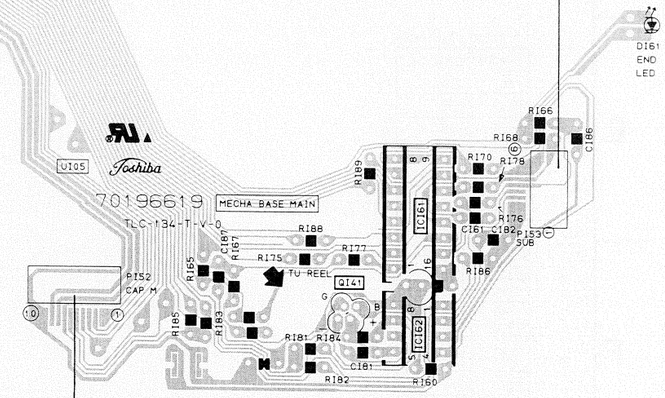


UI02 F/L PC Board



PI41 ↕ PI53

PI51 ↕ P601



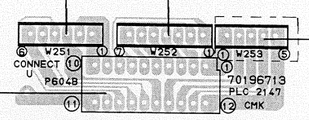
PI52
To Capstan Motor Relay ← 10 – 1

To U202 Main PC Board, W251 ↑

W251
6 – 1

W252
7 – 1
↓ To U202 Main PC Board, W252

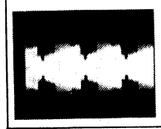
W253
1 – 5
↓ To U202 Main PC Board, W253



U203 Connect U PC Board

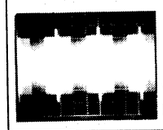
8-3. PIF Circuit

① Z090, Pin ① (SECAM) D-6



V: 20mV/div.
H: 20 μs/div.

② Z090, Pin ① (PAL) D-6

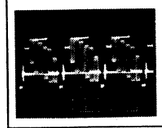


V: 20mV/div.
H: 20 μs/div.

③ Z090, Pin ⑧ (SECAM) E-6

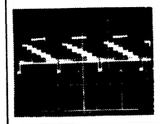
V: 0.5V/div.
H: 20 μs/div.

④ Z090, Pin ⑧ (PAL) E-6



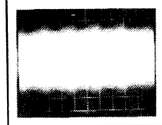
V: 0.5V/div.
H: 20ms/div.

⑤ PB01, Pin ⑧ (PAL) E-7



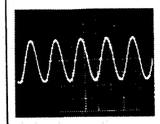
V: 0.5V/div.
H: 20 μs/div.

⑥ PB01, Pin ⑮ (SECAM) D-7



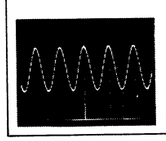
V: 20mV/div.
H: 0.5ms/div.

⑦ PB01, Pin ⑪ (SECAM) D-7



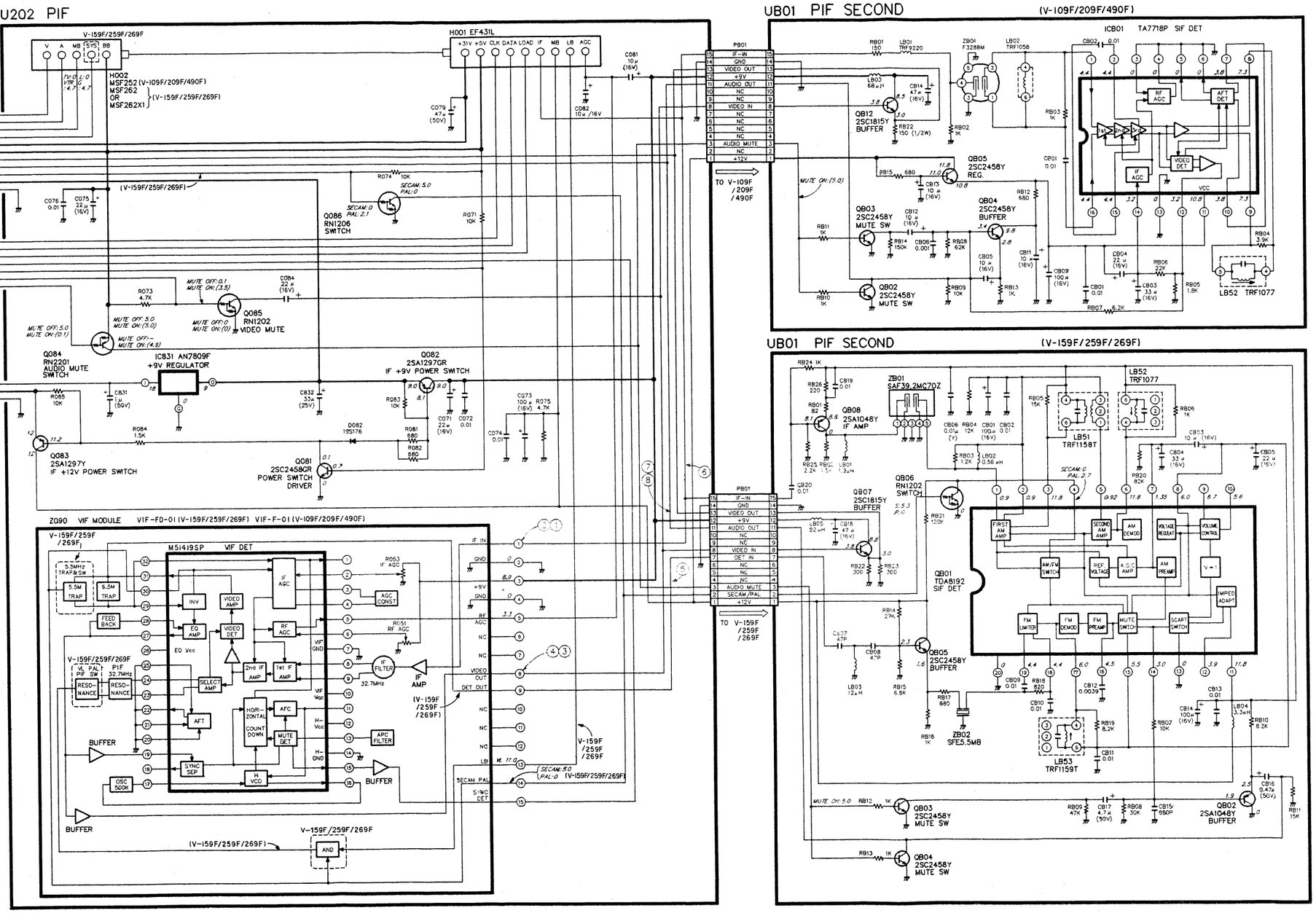
V: 0.5mV/div.
H: 0.5ms/div.

⑧ PB01, Pin ⑪ (PAL) D-7



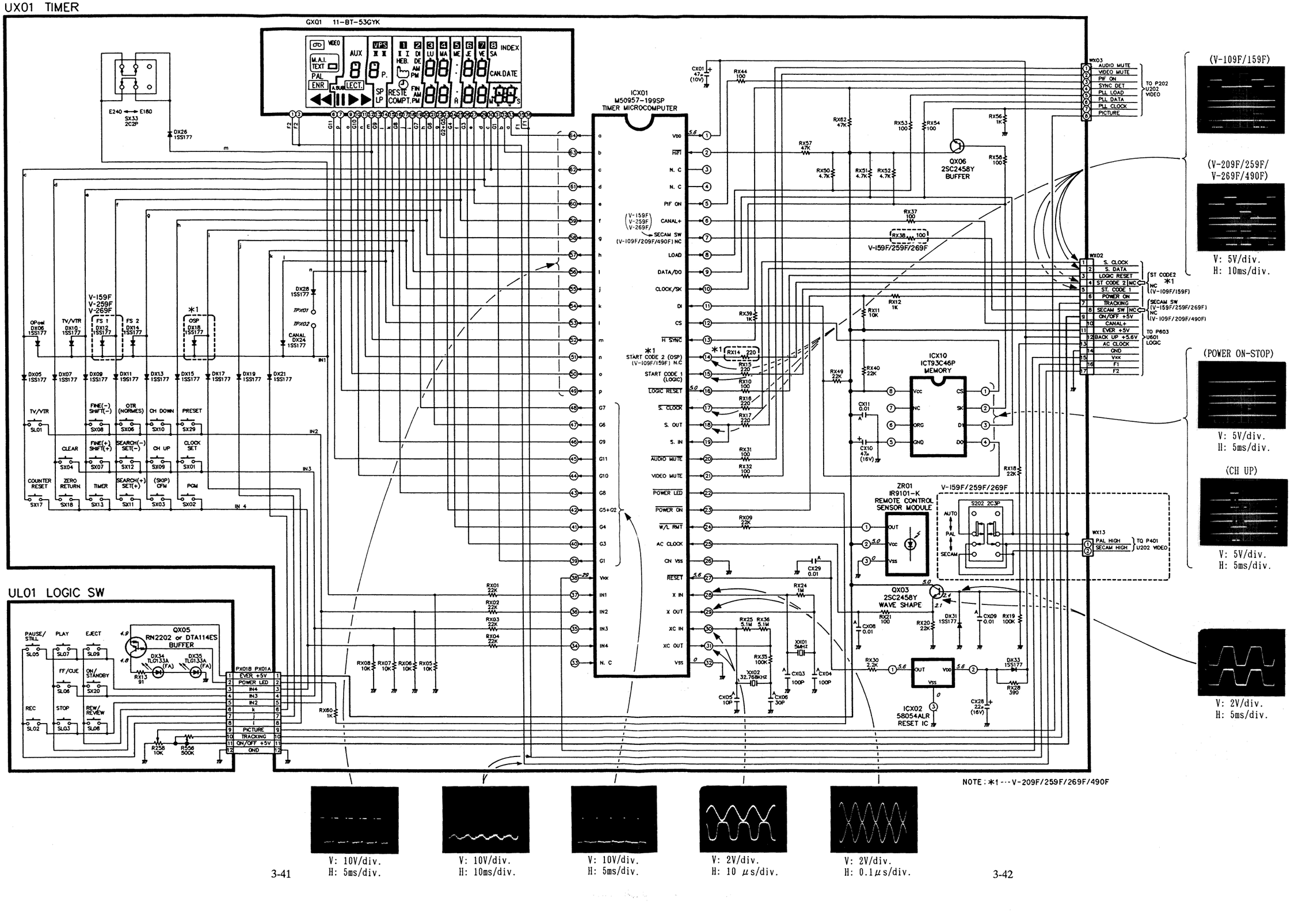
V: 0.5V/div.
H: 0.5ms/div.

Note:
Waveforms for PAL mode are for V-159F/259F/269F.



9-2. Timer Circuit

UX01 TIMER



V: 5V/div.
H: 10ms/div.

V: 5V/div.
H: 5ms/div.

V: 5V/div.
H: 5ms/div.

V: 2V/div.
H: 5ms/div.

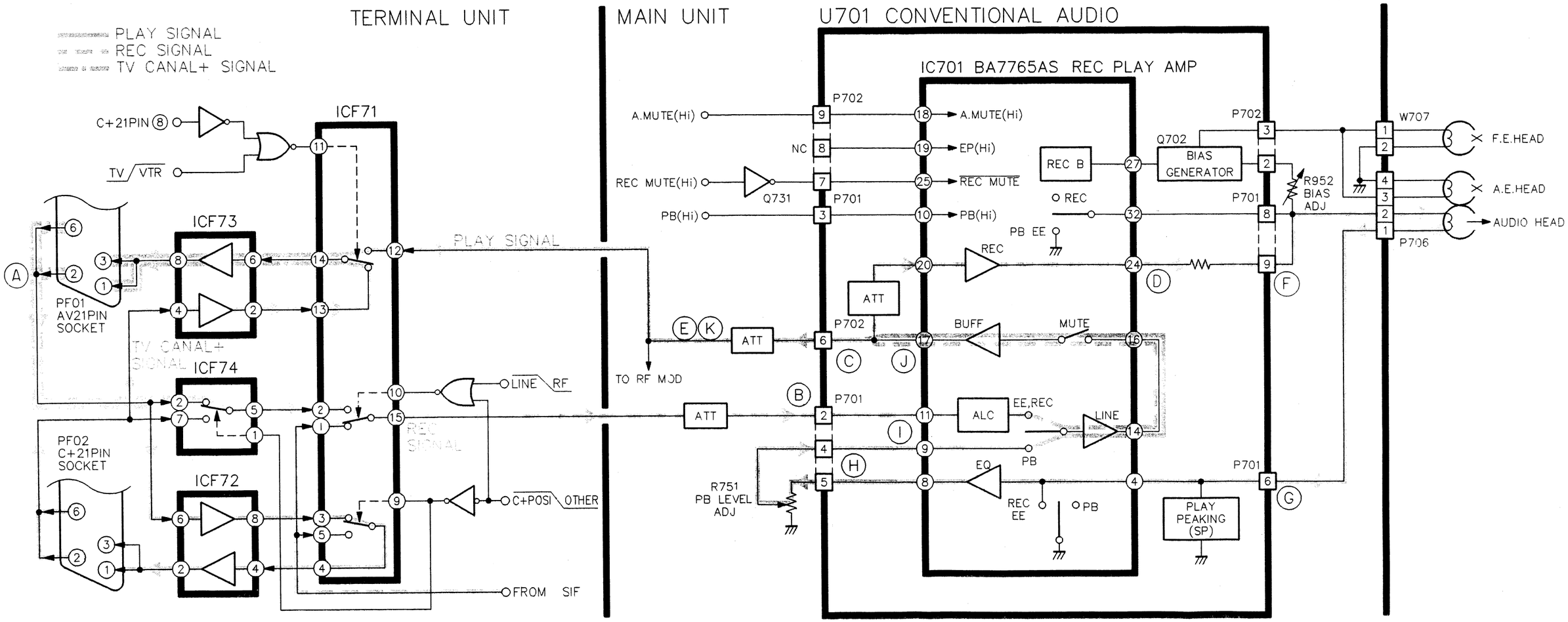
V: 10V/div.
H: 5ms/div.

V: 10V/div.
H: 10ms/div.

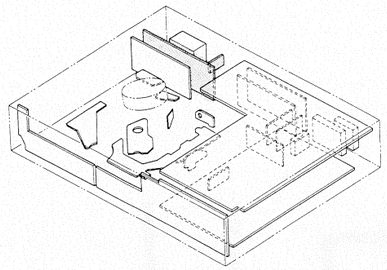
V: 10V/div.
H: 5ms/div.

V: 2V/div.
H: 10 μs/div.

V: 2V/div.
H: 0.1μs/div.


TERMINAL UNIT
MAIN UNIT
U701 CONVENTIONAL AUDIO
PLAY SIGNAL
REC SIGNAL
TV CANAL+ SIGNAL
IC701 BA7765AS REC PLAY AMP
ICF71
ICF73
ICF74
ICF72
C+21PIN
TV/VTR
PF01 AV21PIN SOCKET
PF02 C+21PIN SOCKET
TV CANAL+ SIGNAL
REC SIGNAL
LINE/RF
C+POSI/OTHER
FROM SIF
TO RF MOD
A.MUTE(Hi)
NC
REC MUTE(Hi)
Q731
PB(Hi)
EP(Hi)
REC MUTE
REC
PB EE
ATT
BUFF
MUTE
ALC
EE,REC
LINE
EQ
PB
REC EE
R751 PB LEVEL ADJ
REC B
BIAS GENERATOR
Q702
R952 BIAS ADJ
PLAY PEAKING (SP)
W707
F.E.HEAD
A.E.HEAD
AUDIO HEAD
P706
P701
P702

7-2. Power Supply PC Board



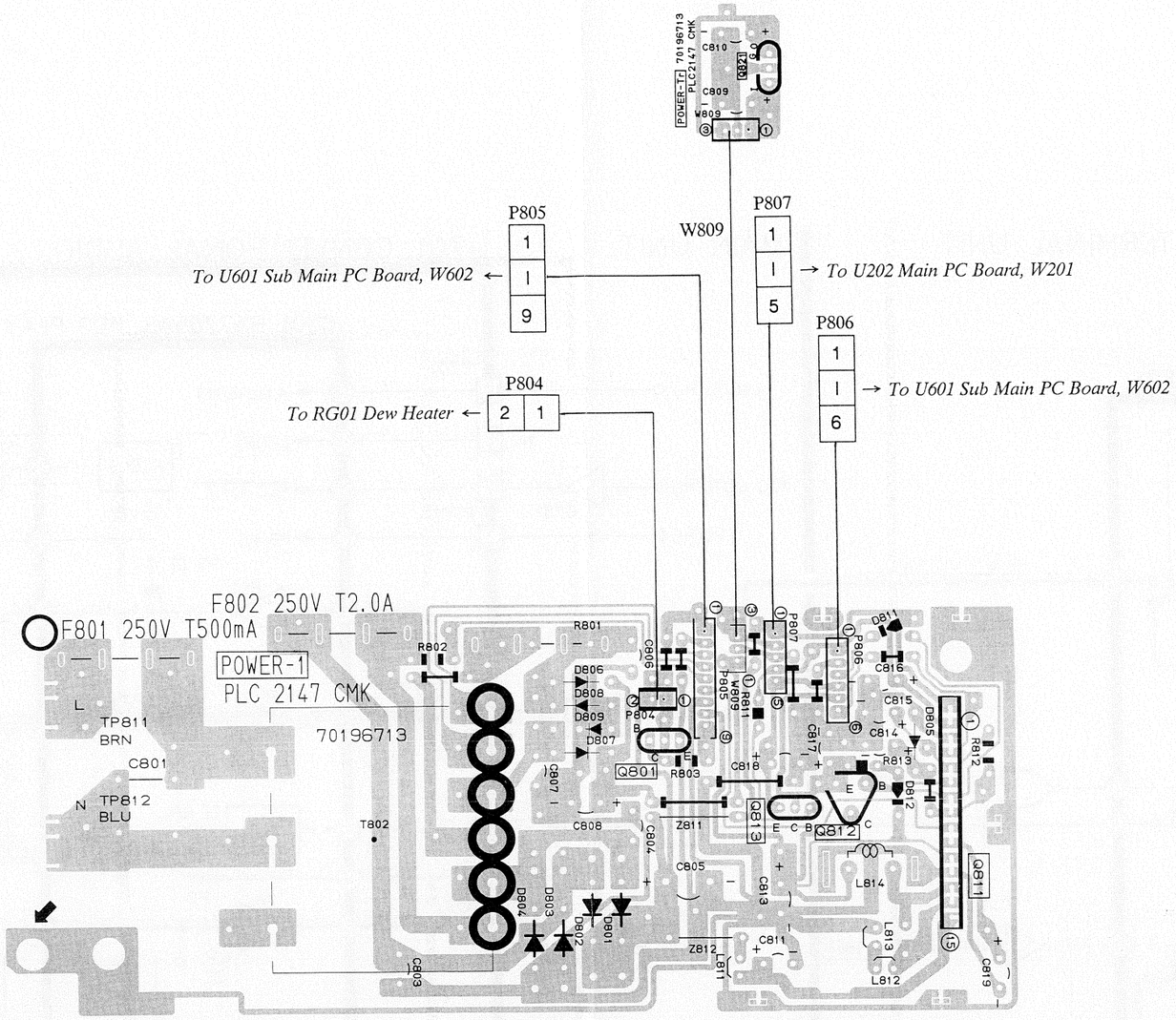
Location of IC

Symbol No.	Location
Q811	E-8

Location of Diodes

Symbol No.	Location
D801	E-6
D802	E-6
D803	E-6
D804	E-6
D805	E-8
D806	D-6
D807	E-6
D808	D-6
D809	D-6
D811	D-7
D812	E-7

U802 Power Transistor PC Board



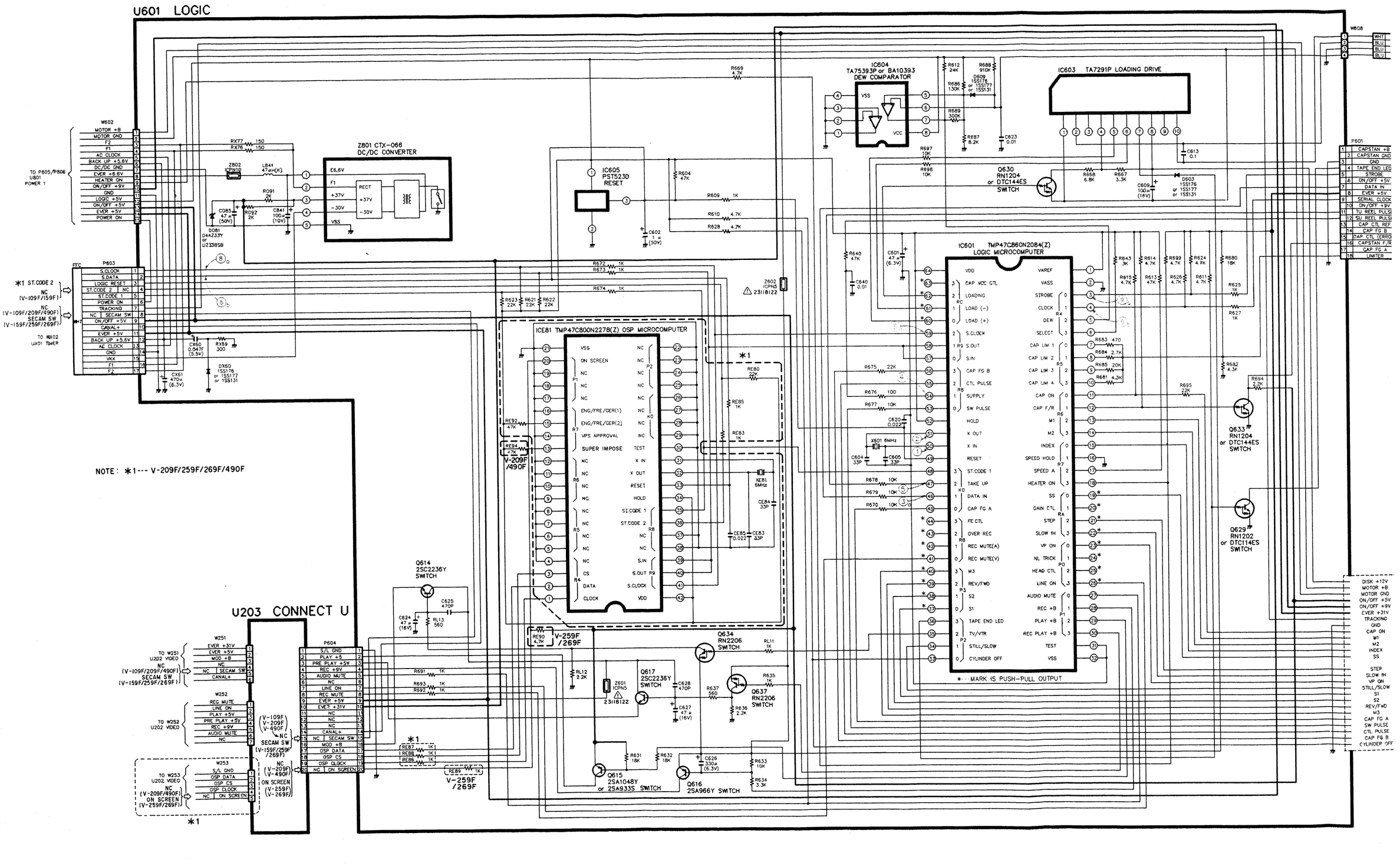
U801 Power 1 PC Board

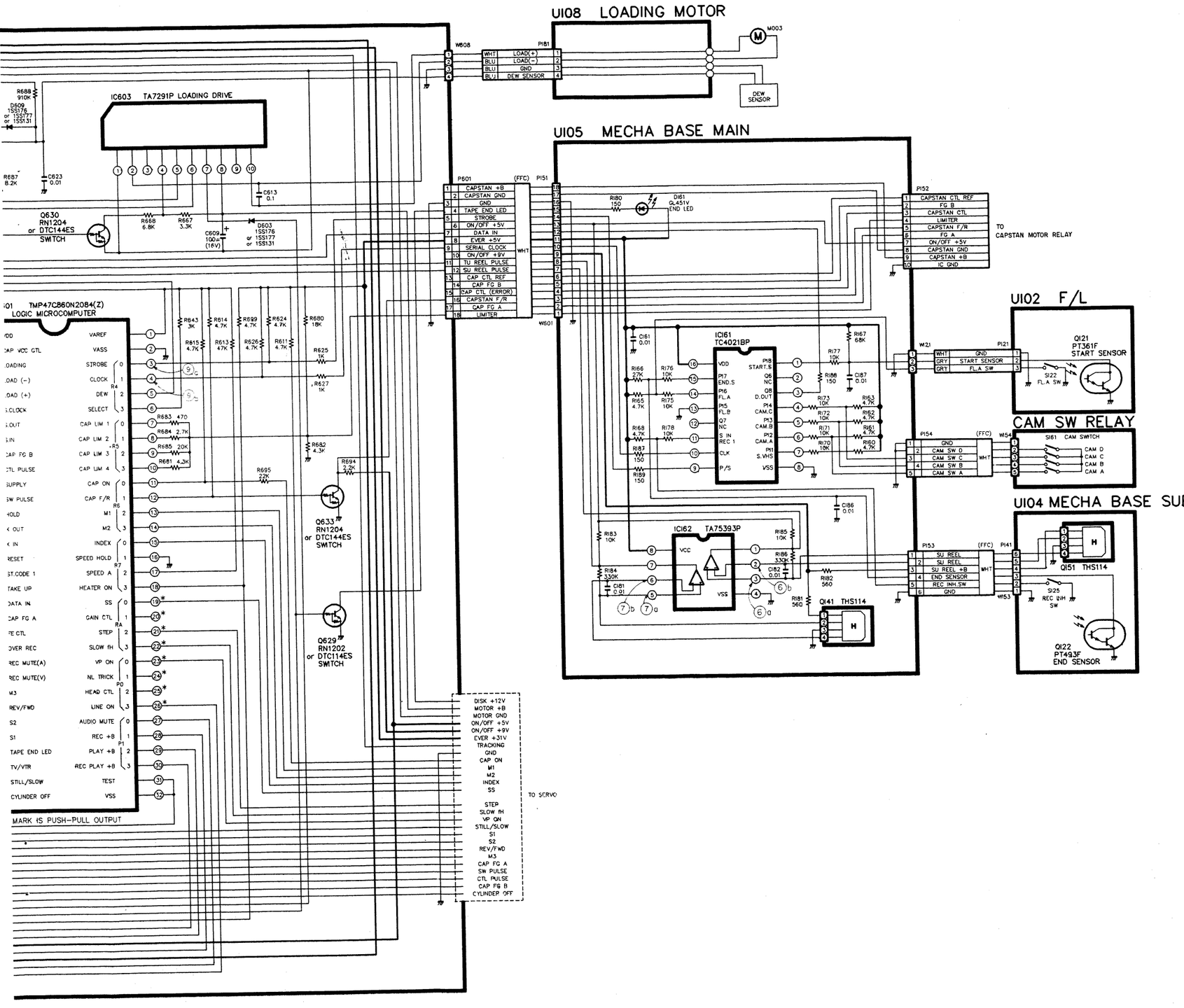
Voltage and Location of Transistors

Unit:V

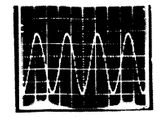
Symbol No.	Q801			Q812			Q813			Q821		
	E	C	B	E	C	B	E	C	B	I	G	O
S-BY	0	0	1.3	4.9	6.7	5.4	4.9	4.9	0	21.5	0	12.0
EE	0	18.5	0	5.0	6.6	5.6	5.0	5.0	5.7	19.0	0	12.0
PLAY	0	18.0	0	5.0	6.6	5.6	5.0	5.0	5.7	20.7	0	12.0
REC	0	17.4	0	5.0	6.6	5.6	5.0	5.0	5.7	18.6	0	12.0
Location	E-6			E-7			E-7			A-7		

10-3. Logic Circuit



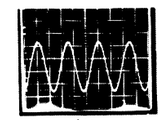


① IC601, Pin ㊿ D-8



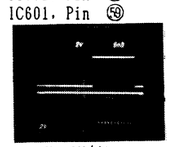
V: 1V/div.
H: 0.1μs/div.

② IC601, Pin ㊿① D-8



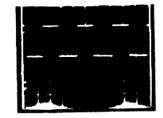
V: 1V/div.
H: 0.1μs/div.

③ a: IC601, Pin ㊻ E-8
b: IC601, Pin ㊽ D-8



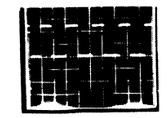
V: 2V/div.
H: 5ms/div.

④ IC601, Pin ㊹ D-8



V: 2V/div.
H: 0.2 s/div.

⑤ IC601, Pin ㊼ E-8

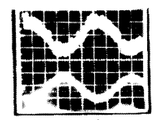


V: 2V/div.
H: 0.2s/div.

⑥ a: IC162, Pin ③ B-8
b: IC162, Pin ② B-7

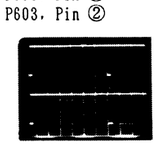
V: 20mV/div.
H: 0.1s/div.

⑦ a: IC162, Pin ⑤ B-8
b: IC162, Pin ⑥ B-8



V: 20mV/div.
H: 0.1s/div.

⑧ a: P603, Pin ① C-2
b: P603, Pin ② C-2

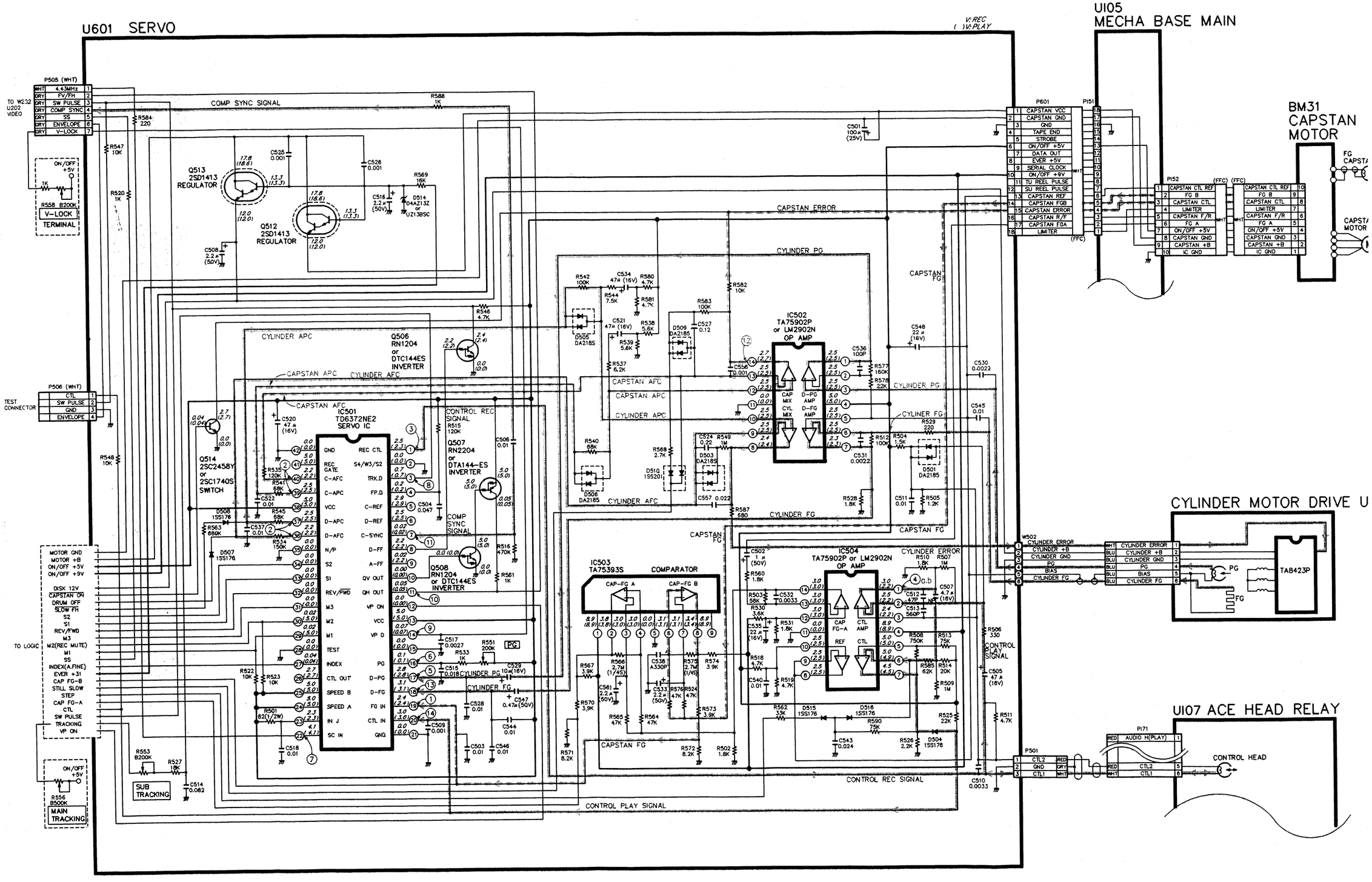


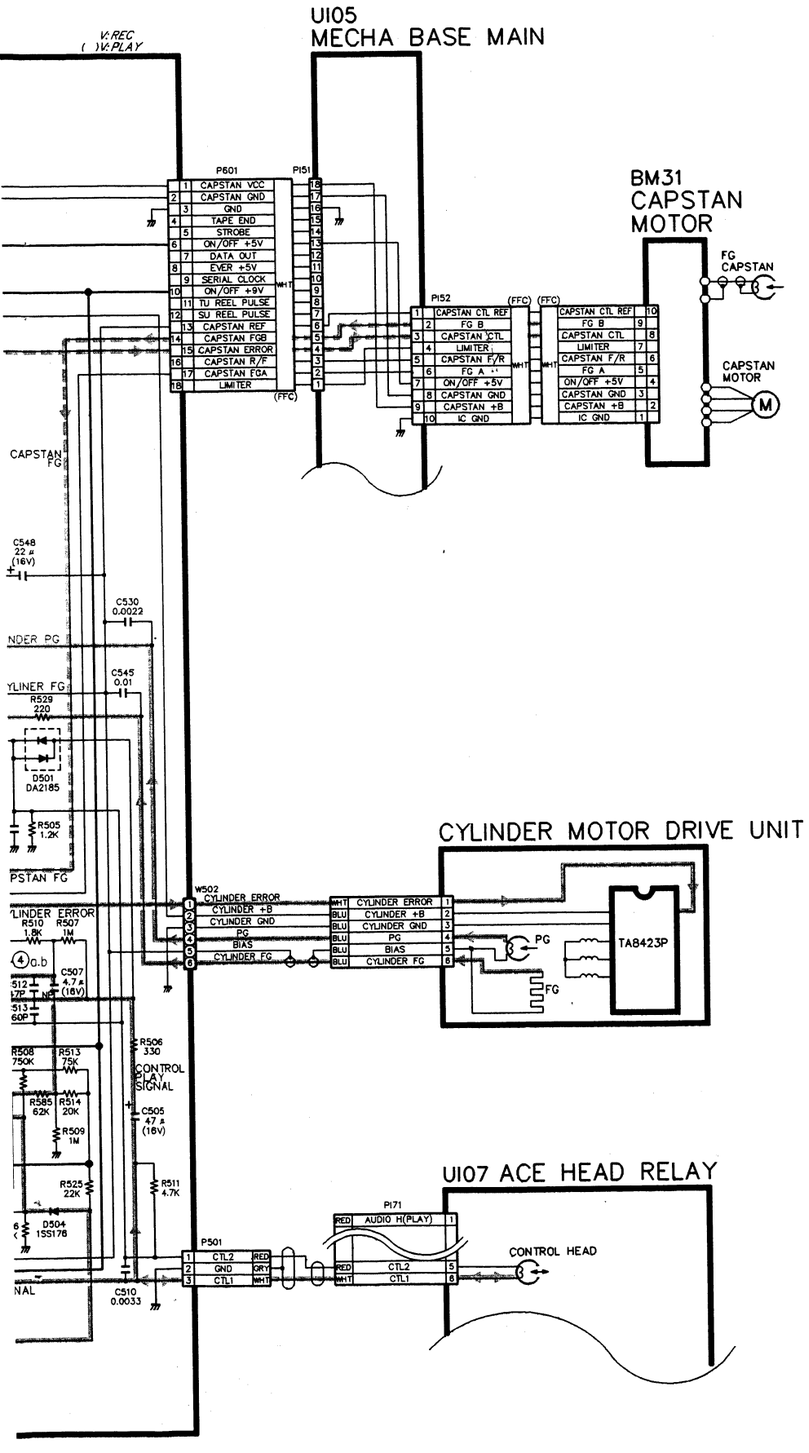
V: 2V/div.
H: 100μs/div.

⑨ a: IC601, Pin ③ C-10
b: IC601, Pin ④ D-10

V: 2V/div.
H: 100μs/div.

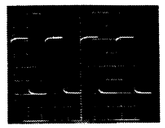
11-2. Servo Circuit





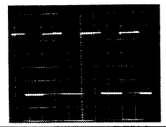
Cylinder Servo

① IC501, Pin ⑲ F-5



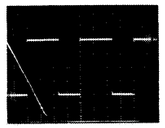
V: 1V/div.
H: 0.5ms/div.

② IC501, Pin ㊳, ㊲, ㊴, ㊵ E-4 D-4



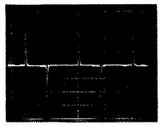
V: 1V/div.
H: 10 μs/div.

③ IC501, Pin ① D-5



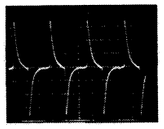
V: 1V/div.
H: 10ms/div.

④ a: IC504, Pin ① E-9



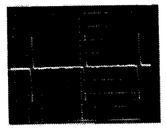
(REC)
V: 0.5V/div.
H: 10ms/div.

④ b: IC504, Pin ① E-9



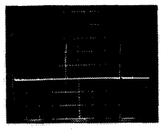
(CUE)
V: 0.5V/div.
H: 2ms/div.

⑤ IC501, Pin ⑰ F-5



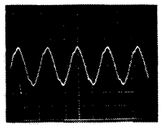
V: 0.2V/div.
H: 10ms/div.

⑥ IC501, Pin ⑯ F-5



(PLAY)
V: 1V/div.
H: 5ms/div.

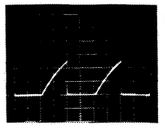
⑦ IC501, Pin ㉒ F-4



(POWER ON)
V: 0.1V/div/
H: 0.1μs/div.

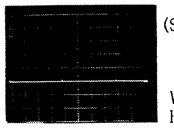
Capstan Servo

⑧ IC501, Pin ③ D-5



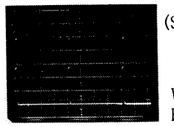
(PLAY)
V: 1V/div.
H: 10ms/div.

⑨ IC501, Pin E-5



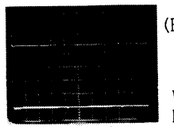
(STILL)
V: 1V/div.
H: 5ms/div.

⑩ IC501, Pin ⑪ E-5



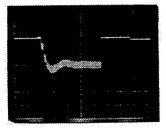
(STILL)
V: 1V/div.
H: 5ms/div.

⑪ IC501, Pin ⑦ E-5



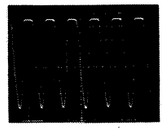
(EE)
V: 1V/div.
H: 5ms/div.

⑫ IC502, Pin ⑭ D-7



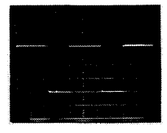
(SLOW)
V: 0.5mV/div.
H: 10ms/div.

⑬ IC501, Pin ⑱ F-5



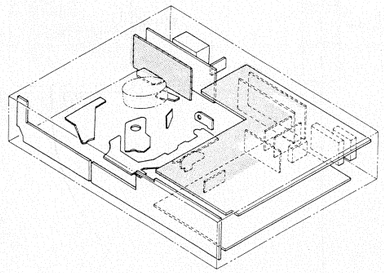
V: 0.5V/div.
H:1ms/div.

⑭ IC501, Pin ⑳ F-5

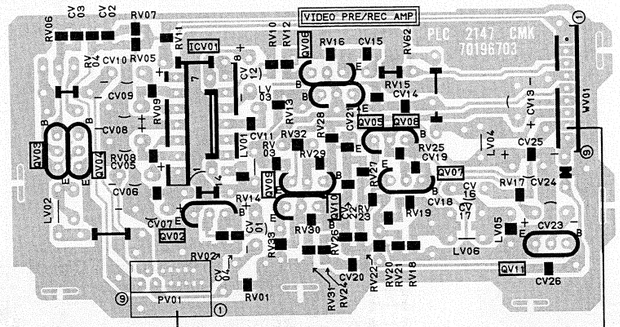


(PLAY)
V: 1V/div.
H: 10ms/div.

12-2. Video PC Board (V-109F/209F/490F)



UV01 Pre Amp PC Board

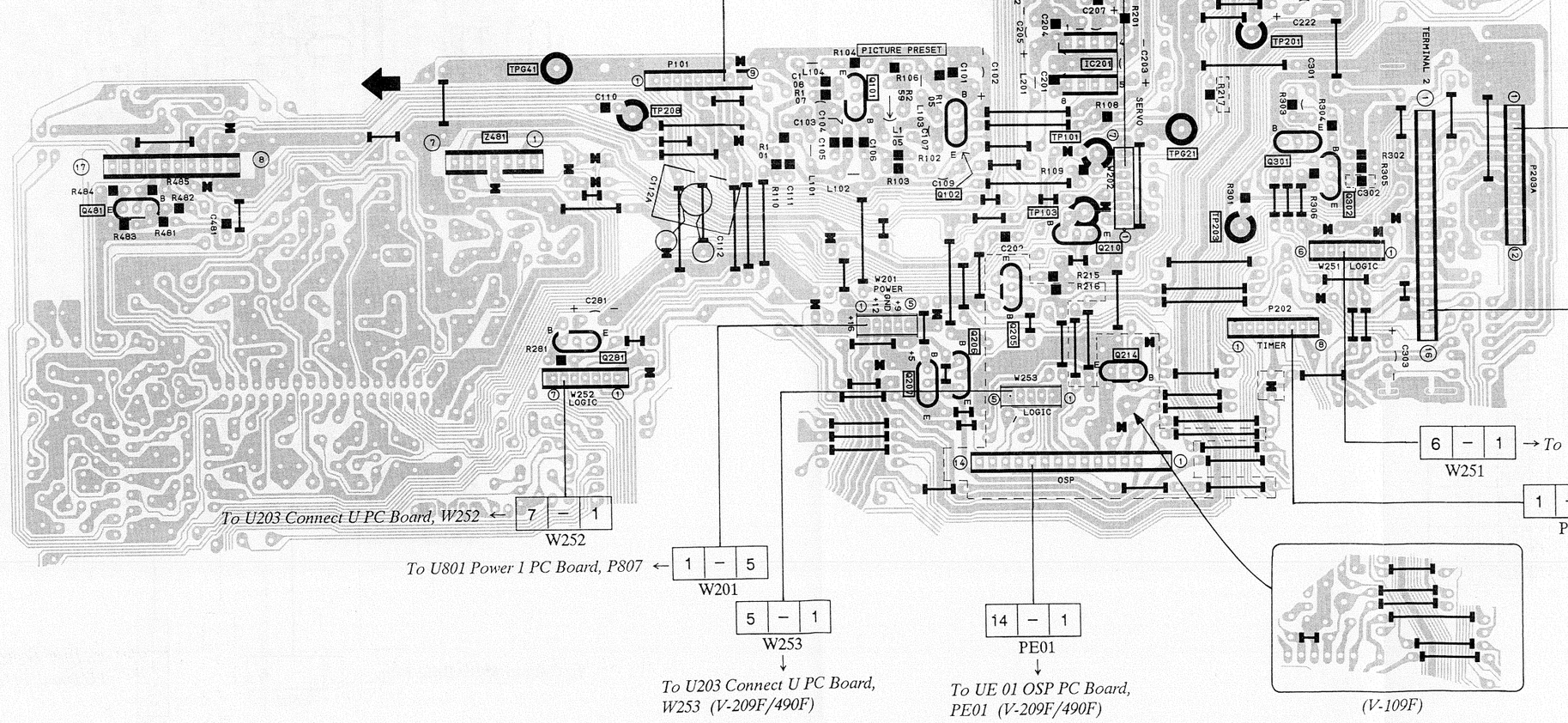


To Head Relay ← 9 – 1
PV01

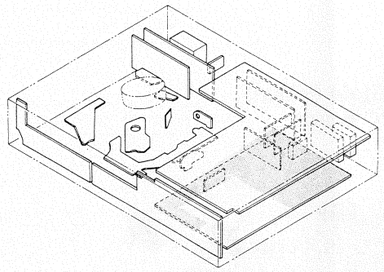
WV01
↕
P101

W202
7
I
1
→ To U601 Sub Main PC Board, P505

U202 Main (Video) PC Board



11-3. Servo PC Board



Voltage and location of Transistors V: REC (V): PLAY

Symbol No.	Voltage(Unit:V) E	C	B	Location
Q506	0.0(0.0)	2.4(2.4)	2.2(2.2)	D-8
Q507	5.0(5.0)	0.05(0.05)	5.0(5.0)	D-9
Q508	0.0(0.0)	5.0(5.0)	0.0(0.0)	D-8
Q512	12.0(12.0)	17.8(18.6)	13.3(13.3)	C-4
Q513	12.0(12.0)	17.8(18.6)	13.3(13.3)	C-4
Q514	0.0(0.0)	2.7(2.7)	0.04(0.04)	F-8

Location of ICs

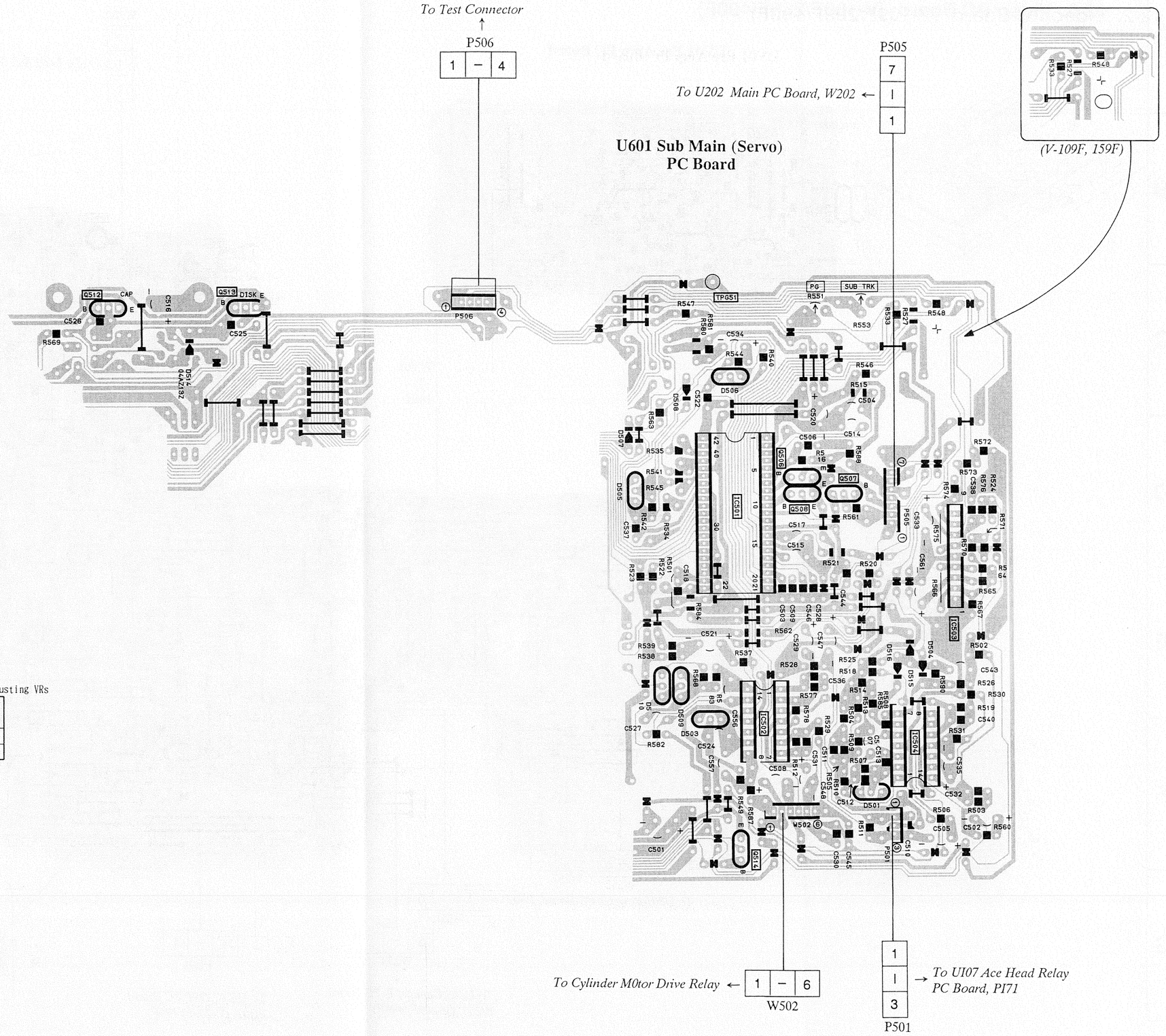
Symbol No.	Location
IC501	D-8
IC502	F-8
IC503	E-9
IC504	F-9

Location of Diodes

Symbol No.	Location
D501	F-9
D503	F-8
D504	E-9
D505	D-7
D506	C-8
D507	D-7
D508	C-8
D509	E-8
D510	E-7
D514	C-4
D515	E-9
D516	E-9

Location of Adjusting VRs

Symbol No.	Location
R551	C-9
R553	C-9


To Test Connector
P506
1 – 4
P506
To U202 Main PC Board, W202
P505
7
1
1
U601 Sub Main (Servo) PC Board
(V-109F, 159F)
Q512 CAP
Q513 DISK
C526
C525
R569
D514 UAZ13Z
TP551
PG
SUB TRK
R551
R553
R547
R548
R544
R546
D506
C520
C504
C506
C514
R572
R573
R574
R575
R571
R570
R565
R567
R502
C543
R526
R530
R519
C540
R531
C535
C532
R503
C505
C502
R560
R506
C510
P501
W502
R549
R587
Q514
C501
C545
C580
R511
D501
R512
R507
C508
C531
C511
R529
R578
R577
C528
C546
C547
C529
R562
C549
C503
C544
C517
C515
R521
R520
C518
R523
R501
R522
R534
R542
C537
R545
D505
R541
R535
D507
C522
D508
R563
R540
C534
R547
R581
R580
R533
R527
R548
R553
R546
R515
C504

Voltage and Location of Transistors

V : PAL REC (V) : PAL PLAY <V> : MESECAM REC {V} : MESECAM PLAY

Symbol No.	Voltage(Unit:V) E	C	B	Location
Q101	0(0.3)	0(2.4)	0(1.0)	D-6
Q102	0(1.7)	0(5.0)	0(2.4)	E-7
Q202	0(1.9)	0(0)	0(1.2)	C-7
Q203	0(0)	0.1(0)	0.2(4.9)	C-8
Q204	3.0(3.2)	5.0(5.0)	3.7(3.9)	C-9
Q205*	5.0(5.0)	0/4.4(0/4.4)	5.0/2.8(5.0/2.8)	F-7
Q206	8.8(8.8)	0(8.7)	8.8(0)	F-7
Q207	0(0)	8.8(0)	0(5.0)	F-6
Q210	0(0)	4.0/0(4.0/0)	0/4.5(0/4.5)	E-7
Q211				C-7
Q214				F-8
Q281	4.9(0)<4.9>{0}	4.9(4.9)<4.9>{4.9}	5.7(0)<5.7>{0}	F-5
Q301	2.9(2.9)	0(0)	2.2(2.2)	E-8
Q302	5.0(5.0)	8.8(8.8)	5.7(5.7)	E-9
Q481	0(0.6)<0>{0.6}	0.1(2.4)<0.1>{2.4}	0(1.2)<0>{1.2}	E-2
Q482	0.9(0.9)<0.9>{2.3}	4.9(4.9)<4.9>{4.9}	0(0)<0>{3.0}	E-2

* :V-209F/490F

Voltage and Location of Transistors V : REC (V) : PLAY

Symbol No.	Voltage(Unit:V) E	C	B	Location
QV02	0(0)	4.2(0)	0.1(0.8)	B-3
QV03	0(0)	0(0)	0.8(0)	B-3
QV04	0(0)	0(0)	0.8(0)	B-3
QV05	0(1.7)	0.1(5.0)	0(2.4)	B-4
QV06	0(2.2)	0.1(5.0)	0(2.9)	B-4
QV07	0.1(0)	6.6(0)	1.4(0)	B-5
QV08	5.9(0)	8.7(0)	6.6(0)	B-4
QV09	8.4(0)	4.2(0)	7.7(0)	B-4
QV10	0.3(0)	4.2(0)	0.9(0)	B-4
QV11	0(0)	1.8max(0)	0(2.4)	C-5

Location of ICs

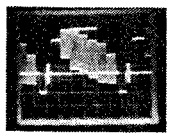
Symbol No.	Location
IC201	D-7
ICV01	B-4

Location of Adjusting VRs

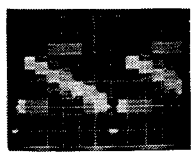
Symbol No.	Location
R257	C-7
R259	D-6
R558	C-10

Photo. No.㉔ ,㉕ are for V-109F/209F/490F

① TP201 D-6

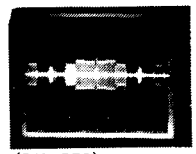


(PAL REC)
V: 0.2V/div.
H: 10 μs/div.

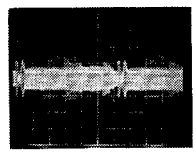


(SECAM REC)
V:0.2V/div
H:10μs/div.

⑦ TP208 A-10

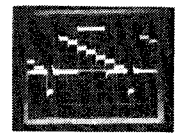


(PAL REC)
V: 0.1V/div.
H: 10 μs/div.



(SECAM REC)
V: 0.1V/div.
H: 10 μs/div.

⑪ TP212 B-7

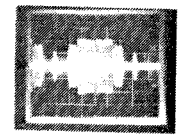


(PAL PLAY, SECAM PLAY)
V: 0.1V/div.
H: 10 μs/div.

⑫ TP213 B-7

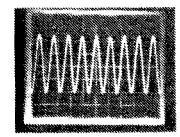
(PAL PLAY, SECAM PLAY)
V: 0.1V/div.
H: 10 μs/div.

⑯ Z401, Pin ㊳ D-14



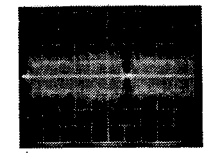
(PAL PLAY)
V: 0.02V/div.
H: 10 μs/div.

⑰ Z401, Pin ① G-14



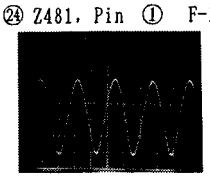
(PAL PLAY)
V: 0.1V/div.
H: 0.1μs/div.

㉓ Z481, Pin ⑰ F-8



(SECAM PLAY)
V: 0.1V/div.
H: 10 μ/div.

㉔ Z481, Pin ① F-10

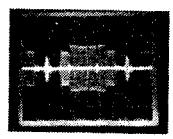


(SECAM PLAY)
V: 0.1V/div.
H: 50ns/div.

② Z201, Pin ⑧ D-6

(PAL REC, SECAM REC)
V: 0.1V/div.
H: 10 μs/div.

⑧ Z401, Pin ㉚ D-13

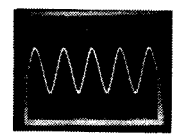


(PAL REC)
V: 0.05V/div.
H: 10 μs/div.

⑬ Z201, Pin ⑤ D-7

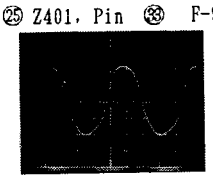
(PAL, SECAM PLAY)
V: 0.2V/div.
H: 10 μs/div.

⑱ Z401, Pin ③ G-13



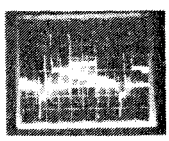
(PAL PLAY)
V: 0.1V/div.
H: 0.1μs/div.

㉕ Z401, Pin ㊴ F-9

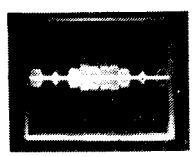


(SECAM PLAY)
V: 0.02V/div.
H: 50ns/div.

③ TP206 D-7

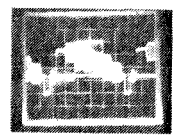


(PAL REC, SECAM REC)
V: 0.2V/div.
H: 10 μs/div.



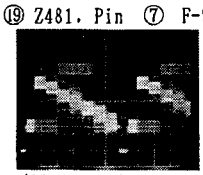
(PAL PLAY)
V: 0.1V/div.
H: 10 μs/div.

⑭ Z201, Pin ⑥ D-7



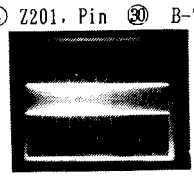
(PAL PLAY)
V: 0.5V/div.
H: 10 μs/div.

⑲ Z481, Pin ⑦ F-9



(SECAM REC)
V: 0.2V/div.
H: 10 μs/div.

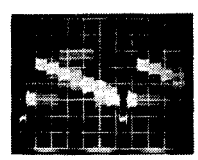
④ Z201, Pin ㉚ B-7



(PAL REC, SECAM REC)
V:0.2V/div
H:10μs/div.

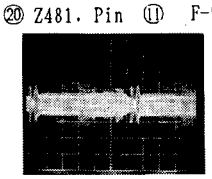
⑨ TP101 F-3

(PAL PLAY)
V: 0.1v/div.
H: 5ms/div.



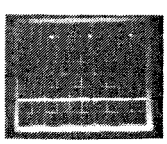
(SECAM PLAY)
V: 0.5V/div.
H: 10 μs/div.

⑳ Z481, Pin ⑪ F-9

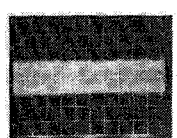


(SECAM REC)
V: 0.1V/div.
H: 10 μs/div.

⑤ TP204 B-7

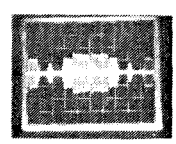


(PAL REC, SECAM REC)
V: 1V/div.
H: 20 μs/div.



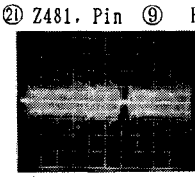
(SECAM PLAY)
V: 0.2V/div.
H: 10 μs/div.

⑮ Z201, Pin ② D-7



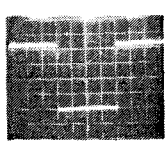
(PAL PLAY)
V: 0.1V/div.
H: 10 μs/div.

㉑ Z481, Pin ⑨ F-9



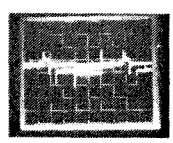
(SECAM PLAY)
V: 0.1V/div.
H: 10 μ/div.

⑥ TP103 B-3

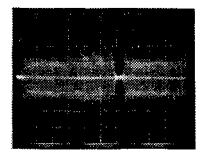


(PAL REC, SECAM REC)
V: 1V/div.
H: 5ms/div.

⑩ Z201, Pin ㉕ B-6

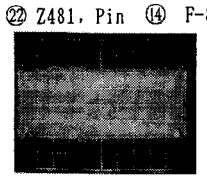


(PAL PLAY, SECAM PLAY)
V: 0.2V/div.
H: 10 μs/div.



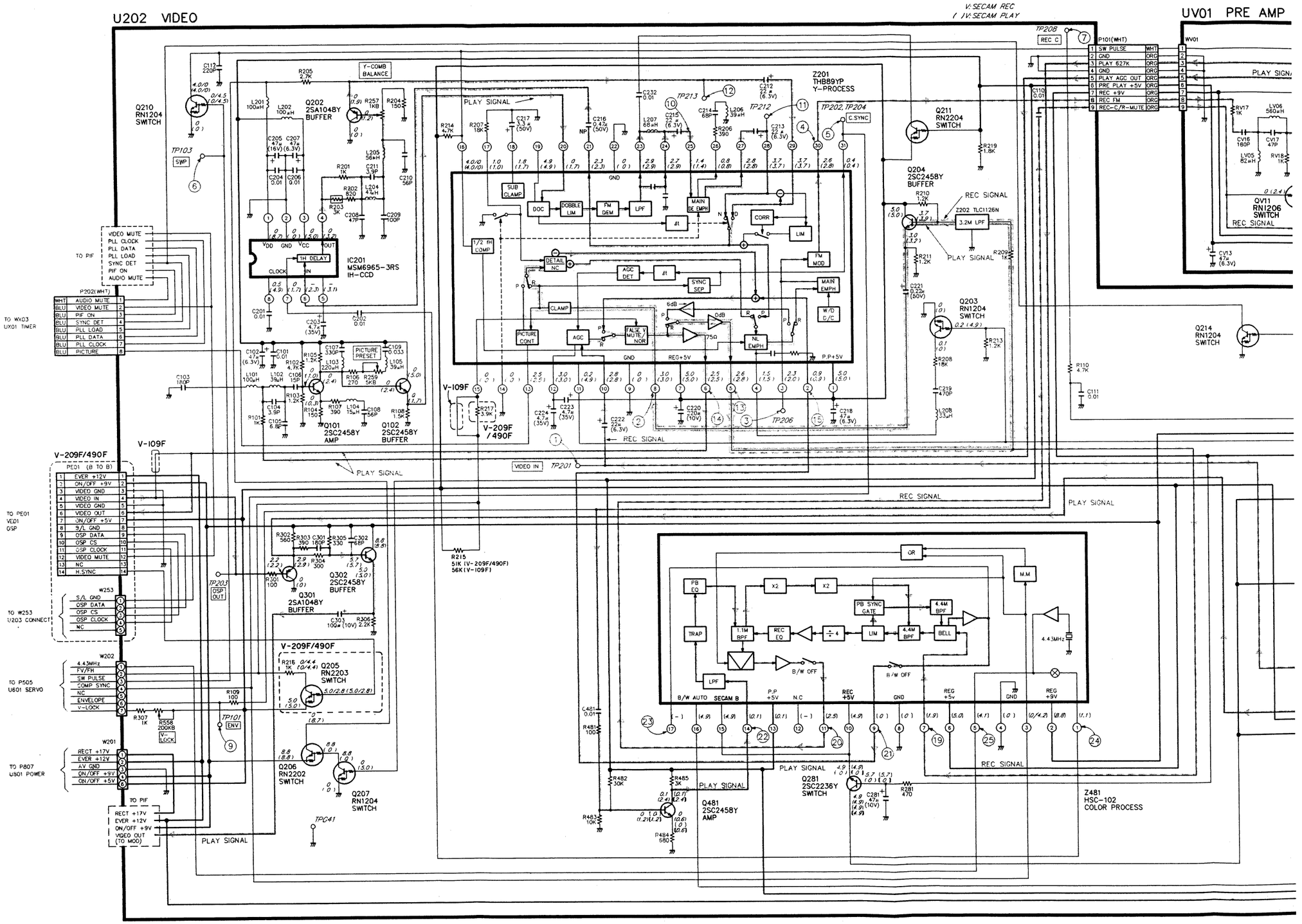
(SECAM PLAY)
V: 0.1v/div.
H: 10 μs/div.

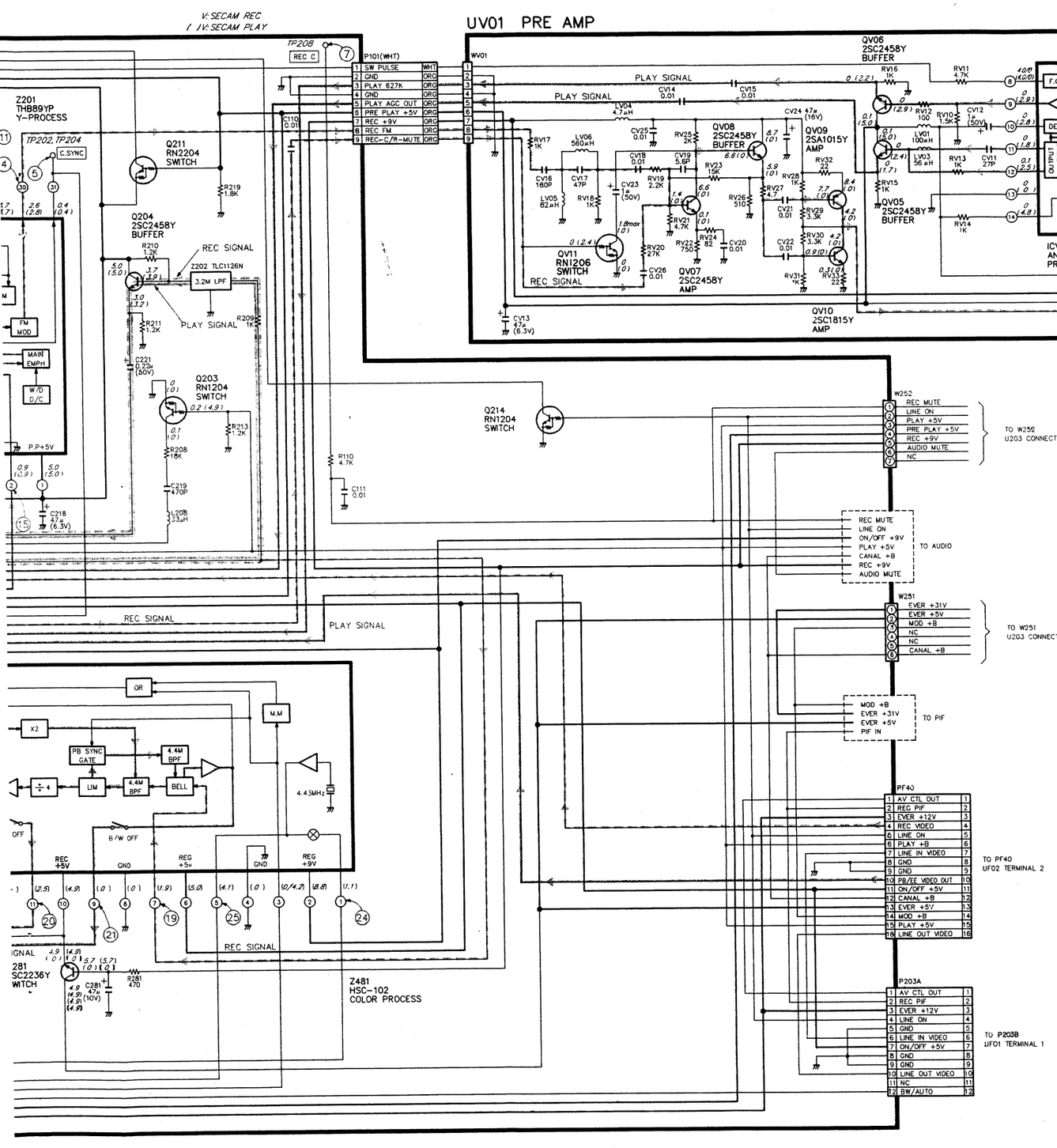
㉒ Z481, Pin ⑭ F-8



(SECAM PLAY)
V: 0.2V/div.
H: 2ms/div.

12-3. Video Circuit (V-109F/209F/490F)

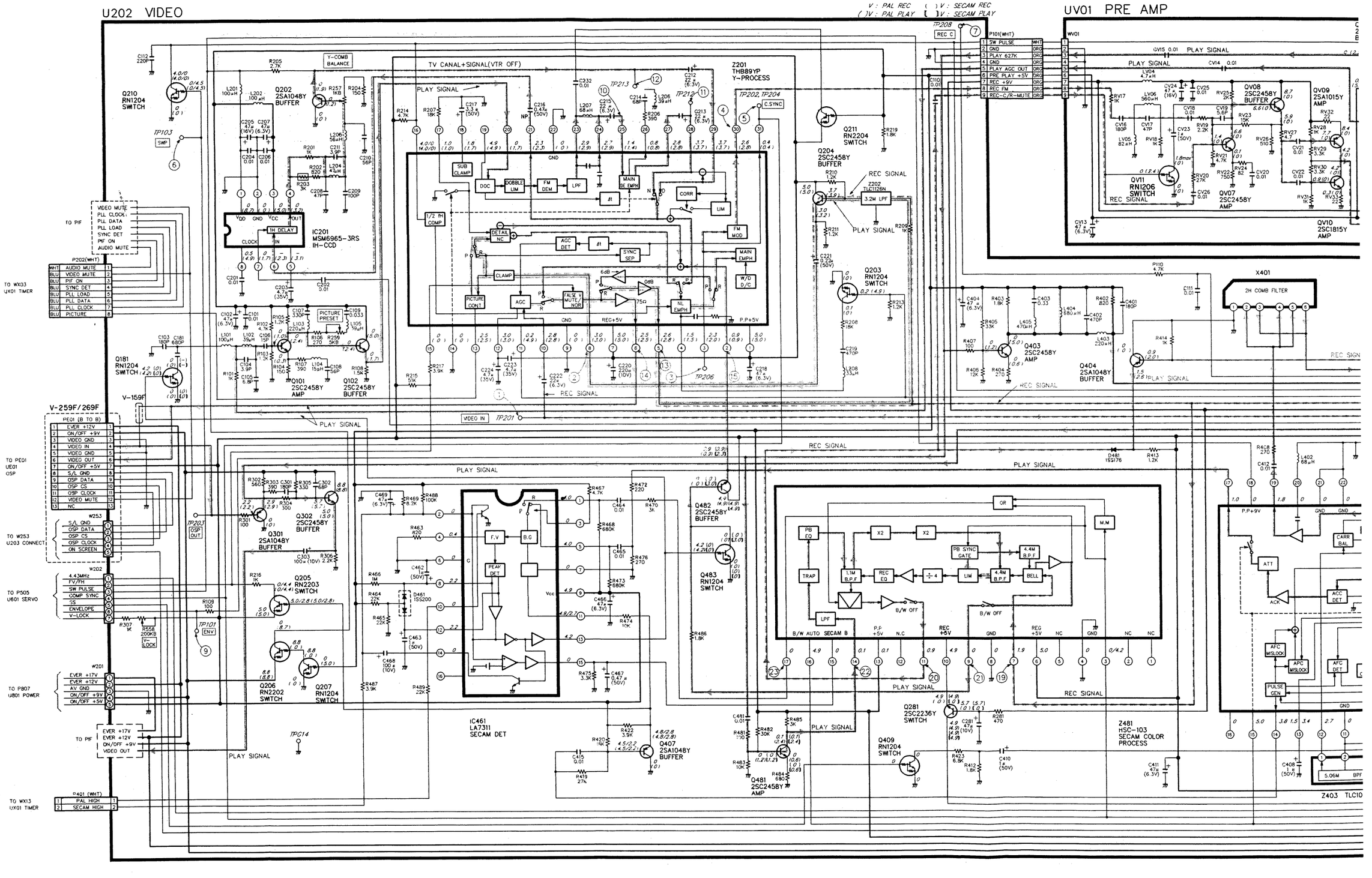


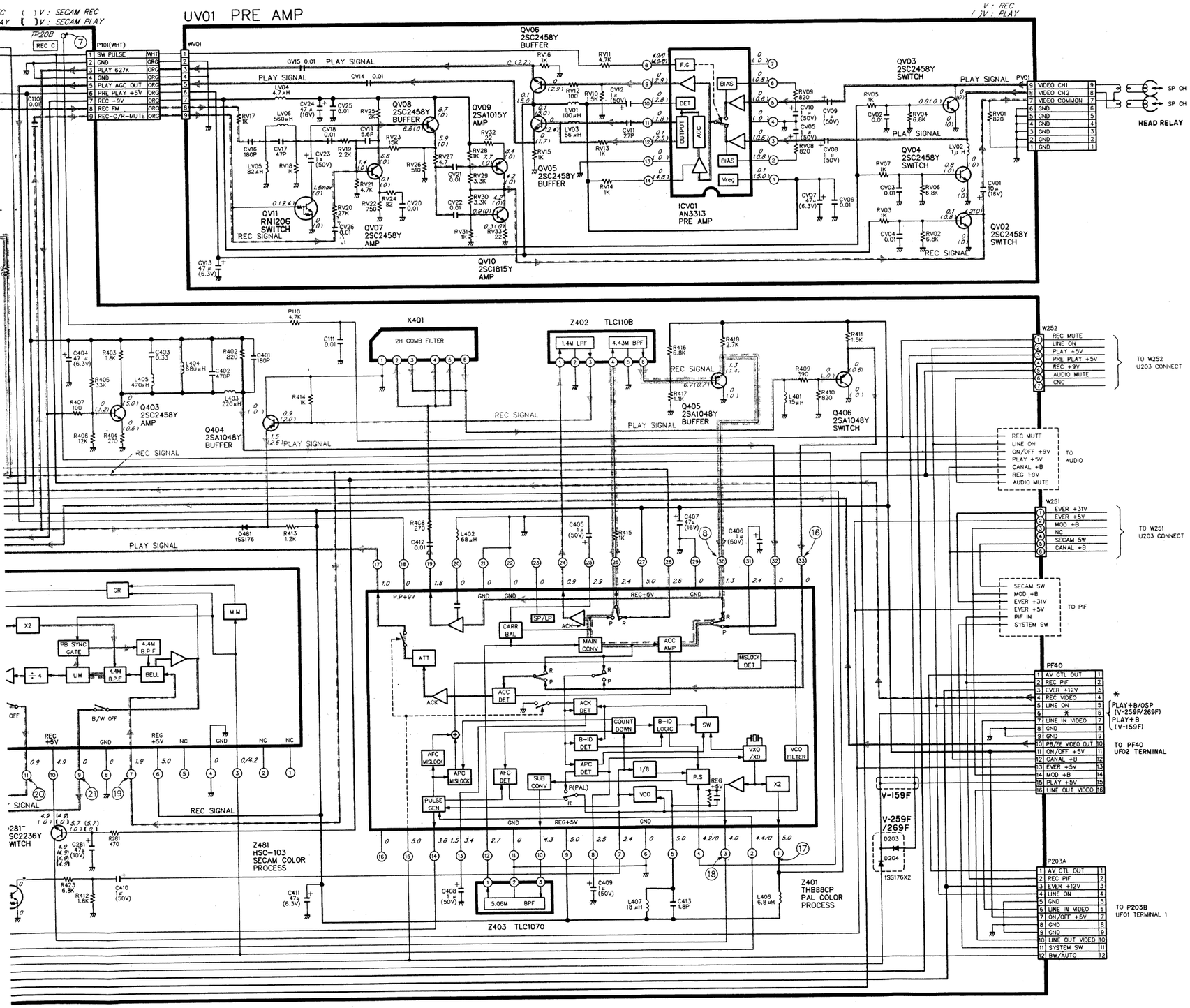


Z481 (V)

PIN No.	SECAM PLAY	SECAM REC	B/W PLAY
1	1.1	1.1	1.1
2	8.8	8.8	8.8
3	0/4.2	0/4.2	0/4.2
4	0	0	0
5	4.1	4.1	4.1
6	5.0	5.0	5.0
7	2.8	1.9	2.8
8	0	0	0
9	3.0	4.2	4.2
10	0.4	4.9	0.4
11	2.5	4.2	4.2
12	–	–	–
13	4.9	0.1	4.9
14	2.4	0.1	2.4
15	0.4	4.9	0.4
16	4.9	0.4	0.4
17	–	–	–

12-4. Video Circuit (V-159F/259F/269F)





IC461 (V)

PIN No.	PAL PLAY	SECAM REC	SECAM PLAY
1	4.0	4.0	4.0
2	0	3.2	3.2
3	4.6	0	4.6
4	0.4	0.4	0.4
5	4.0	4.0	4.0
6	0	0	0
7	0	0	0
8	1.7	2.2	2.3
9	4.9	4.9	4.9
10	0	0	0
11	4.9/2.7	4.9/2.7	4.9/2.7
12	1.7	2.2	2.3
13	4.2	4.2	4.2
14	0	0	0
15	0	0	0
16	–	–	–

Z401 (V)

PIN No.	PAL PLAY	SECAM REC	SECAM PLAY
1	5.0	5.0	5.0
2	4.4/0	4.4/0	4.4/0
3	4.0	4.0	4.0
4	4.2/0	4.2/0	4.2/0
5	5.0	5.0	5.0
6	0	0	0
7	2.4	2.5	2.5
8	2.5	2.5	2.5
9	5.0	5.0	5.0
10	4.3	4.3	4.3
11	0	0	0
12	2.7	2.7	2.7
13	3.4	3.4	3.4
14	3.8/1.5	3.8/1.5	3.8/1.5
15	5.0	5.0	5.0
16	0	4.3	4.3
17	1.0	1.0	1.0
18	8.7	0	8.7
19	1.8	1.8	1.8
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	2.0	0.9	2.0
25	2.9	2.9	2.9
26	2.4	2.4	2.4
27	5.0	5.0	5.0
28	2.8	2.6	2.8
29	0	0	0
30	1.3	1.3	1.3
31	2.4	2.4	2.4
32	5.0	0	5.0
33	0.7	0	0.7

Z481 (V)

PIN No.	PAL PLAY	SECAM REC	SECAM PLAY	B/W REC	B/W PLAY
1	–	–	–	–	–
2	–	–	–	–	–
3	0/4.2	0/4.2	0/4.2	0/4.2	0/4.2
4	0	0	0	0	0
5	–	–	–	–	–
6	5.0	5.0	5.0	5.0	5.0
7	2.8	1.9	2.8	1.9	2.8
8	0	0	0	0	0
9	2.9	0	3.0	4.2	4.2
10	0.4	4.9	0.4	4.9	0.4
11	1.7	2.5	2.5	4.2	4.2
12	–	–	–	–	–
13	4.9	0.1	4.9	0.1	4.9
14	2.4	0.1	2.4	0.1	2.4
15	0	4.2	4.2	0	0
16	4.9	4.9	4.9	0.4	0.4
17	2.3	0	2.3	0	2.3

Voltage and Location of Transistors

V : PAL REC (V) : PAL PLAY <V> : MESECAM REC {V} : MESECAM PLAY

Symbol No.	Voltage(Unit:V) E	C	B	Location
Q101	0(0.3)	0(2.4)	0(1.0)	D-6
Q102	0(1.7)	0(5.0)	0(2.4)	D-7
Q181	0(0)<0>{0}	0(0)<->{-}	4.2(4.2)<0>{0}	D-6
Q202	0(1.9)	0(0)	0(1.2)	B-7
Q203	0(0)	0.1(0)	0.2(4.9)	C-8
Q204	3.0(3.2)	5.0(5.0)	3.7(3.9)	C-9
Q205	5.0(5.0)	0/4.4(0/4.4)	5.0/2.8(5.0/2.8)	E-7
Q206	8.8(8.8)	0(8.7)	8.8(0)	E-7
Q207	0(0)	8.8(0)	0(5.0)	E-6
Q210	0(0)	4.0/0(4.0/0)	0/4.5(0/4.5)	E-8
Q211				C-7
Q281	4.9(0)<4.9>{0}	4.9(4.9)<4.9>{4.9}	5.7(0)<5.7>{0}	E-5
Q301	2.9(2.9)	0(0)	2.2(2.2)	D-8
Q302	5.0(5.0)	8.8(8.8)	5.7(5.7)	E-9
Q403	0(0.6)	0(5.0)	0(1.2)	D-4
Q404	1.5(2.6)	0(0)	0.9(2.0)	E-3
Q405	1.3(1.4)	0(0)	0.7(0.7)	E-4
Q406	0(0.6)	0(0)	0(0)	D-3
Q407	4.8/2.8(4.8/2.8)	0(0)	4.5/2.2(4.5/2.2)	F-3
Q409	0	0	0	F-4
Q481	0(0.6)<0>{0.6}	0.1(2.4)<0.1>{2.4}	0(1.2)<0>{1.2}	E-2
Q482	0.9(0.9)<0.9>{2.3}	4.9(4.9)<4.9>{4.9}	0(0)<0>{3.0}	D-2
Q483	0(0)<0>{0}	0(0)<0>{3.0}	4.2(4.2)<0>{0}	D-2

Voltage and Location of Transistors V : REC (V) : PLAY

Symbol No.	Voltage(Unit:V) E	C	B	Location
QV02	0(0)	4.2(0)	0.1(0.8)	B-3
QV03	0(0)	0(0)	0.8(0)	B-3
QV04	0(0)	0(0)	0.8(0)	B-3
QV05	0(1.7)	0.1(5.0)	0(2.4)	B-4
QV06	0(2.2)	0.1(5.0)	0(2.9)	A-4
QV07	0.1(0)	6.6(0)	1.4(0)	B-5
QV08	5.9(0)	8.7(0)	6.6(0)	B-4
QV09	8.4(0)	4.2(0)	7.7(0)	B-4
QV10	0.3(0)	4.2(0)	0.9(0)	B-4
QV11	0(0)	1.8max(0)	0(2.4)	B-5

Location of ICs

Symbol No.	Location
IC201	D-7
IC461	F-2
ICV01	A-4

Location of Diodes

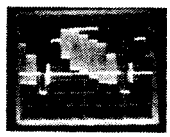
Symbol No.	Location
D203*	E-9
D204*	F-7
D461	F-2
D481	D-3

* : V-259F/269F

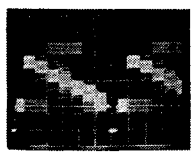
Location of Adjusting VRs

Symbol No.	Location
R257	C-7
R259	D-6
R558	B-10

① TP201 D-6

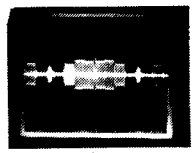


(PAL REC)
V: 0.2V/div.
H: 10 μs/div.

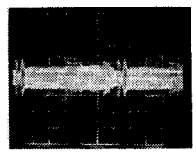


(SECAM REC)
V:0.2V/div
H:10μs/div.

⑦ TP208 A-9

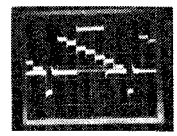


(PAL REC)
V: 0.1V/div.
H: 10 μs/div.



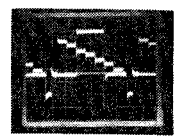
(SECAM REC)
V: 0.1V/div.
H: 10 μs/div.

⑪ TP212 B-7



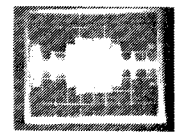
(PAL PLAY, SECAM PLAY)
V: 0.1V/div.
H: 10 μs/div.

⑫ TP213 B-7



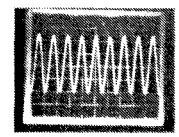
(PAL PLAY, SECAM PLAY)
V: 0.1V/div.
H: 10 μs/div.

⑯ Z401, Pin ㊸ D-14



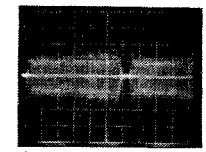
(PAL PLAY)
V: 0.02V/div.
H: 10 μs/div.

⑰ Z401, Pin ① F-14



(PAL PLAY)
V: 0.1V/div.
H: 0.1μs/div.

㉓ Z481, Pin ⑰ F-8

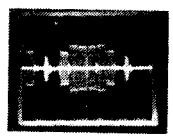


(SECAM PLAY)
V: 0.1V/div.
H: 10 μ/div.

② Z201, Pin ⑧ D-6

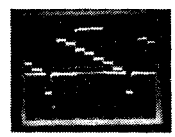
(PAL REC, SECAM REC)
V: 0.1V/div.
H: 10 μs/div.

⑧ Z401, Pin ㉚ D-13



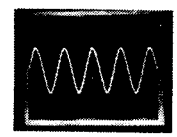
(PAL REC)
V: 0.05V/div.
H: 10 μs/div.

⑱ Z201, Pin ⑤ D-7



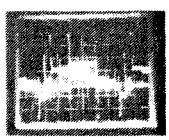
(PAL , SECAM PLAY)
V: 0.2V/div.
H: 10 μs/div.

⑱ Z401, Pin ③ F-13

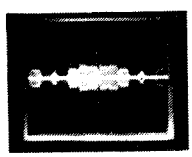


(PAL PLAY)
V: 0.1V/div.
H: 0.1μs/div.

③ TP206 D-7

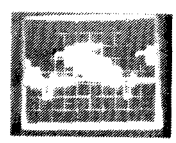


(PAL REC, SECAM REC)
V: 0.2V/div.
H: 10 μs/div.



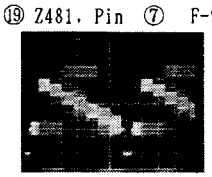
(PAL PLAY)
V: 0.1V/div.
H: 10 μs/div.

⑭ Z201, Pin ⑥ D-7



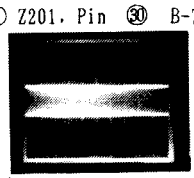
(PAL PLAY)
V: 0.5V/div.
H: 10 μs/div.

⑲ Z481, Pin ⑦ F-9



(SECAM REC)
V: 0.2V/div.
H: 10 μs/div.

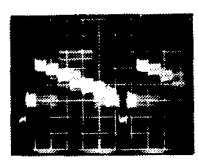
④ Z201, Pin ㉚ B-7



(PAL REC, SECAM REC)
V:0.2V/div
H:10μs/div.

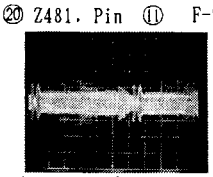
⑨ TP101 F-3

(PAL PLAY)
V: 0.1v/div.
H: 5ms/div.



(SECAM PLAY)
V: 0.5V/div.
H: 10 μs/div.

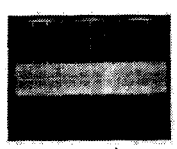
⑳ Z481, Pin ⑪ F-9



(SECAM REC)
V: 0.1V/div.
H: 10 μs/div.

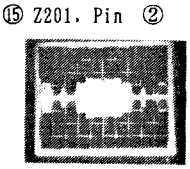
⑤ TP204 B-7

(PAL REC, SECAM REC)
V: 1V/div.
H: 20 μs/div.



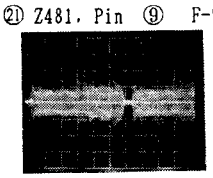
(SECAM PLAY)
V: 0.2V/div.
H: 10 μs/div.

⑮ Z201, Pin ② D-7



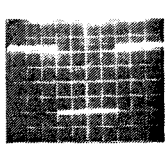
(PAL PLAY)
V: 0.1V/div.
H: 10 μs/div.

㉑ Z481, Pin ⑨ F-9



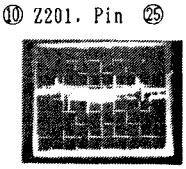
(SECAM PLAY)
V: 0.1V/div.
H: 10 μ/div.

⑥ TP103 B-3

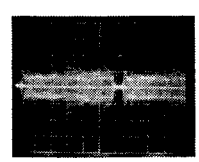


(PAL REC, SECAM REC)
V: 1V/div.
H: 5ms/div.

⑩ Z201, Pin ㉕ B-6

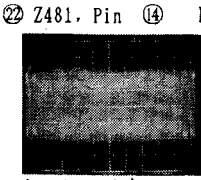


(PAL PLAY, SECAM PLAY)
V: 0.2V/div.
H: 10 μs/div.



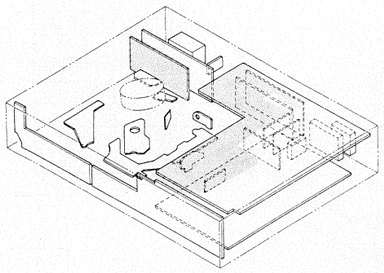
(SECAM PLAY)
V: 0.1v/div.
H: 10 μs/div.

㉒ Z481, Pin ⑭ F-8

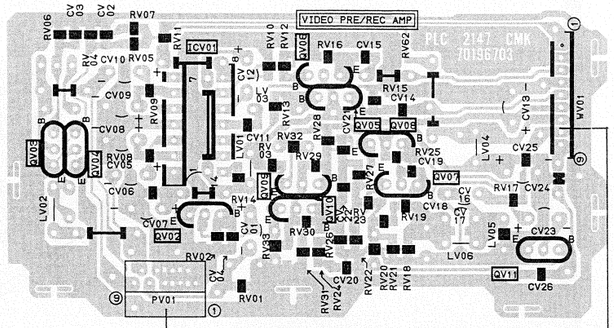


(SECAM PLAY)
V: 0.2V/div.
H: 2ms/div.

12-5. Video PC Board (V-159F/259F269F)



UV01 Pre Amp PC Board

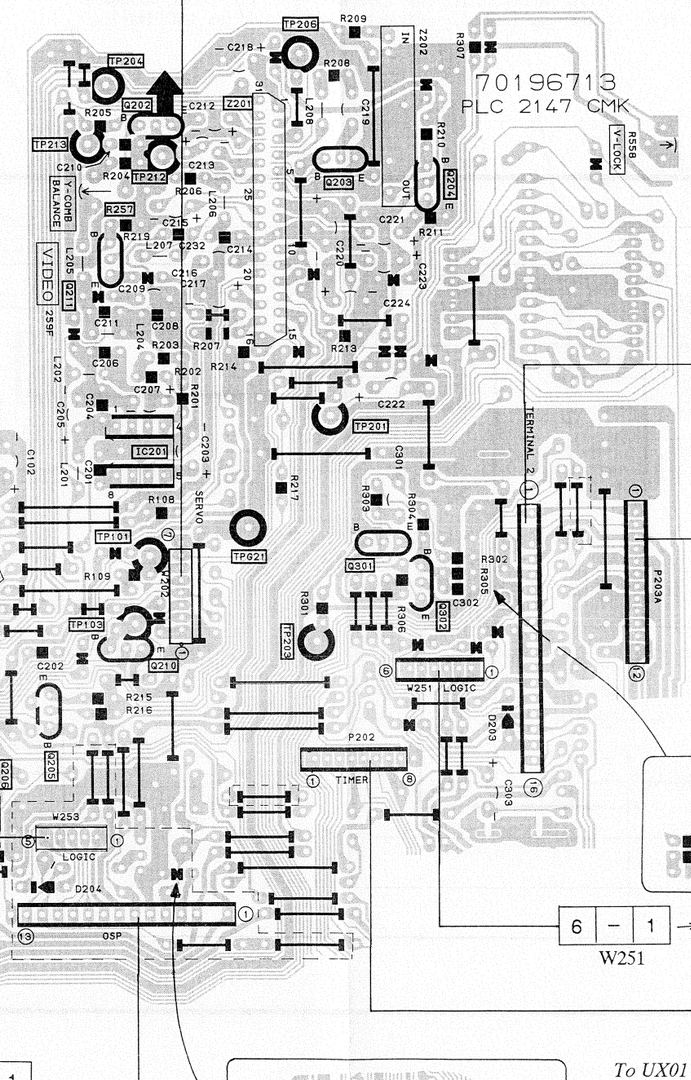


PV01
To Head Relay ← 9 | – | 1

WV01
↕
P101

W202
7
I
1
→ *To U601 Sub Main PC Board, P505*

U202 Main (Video) PC Board

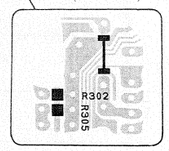


To UF02 Terminal 2 PC Board, PF40

PF40
1
I
16

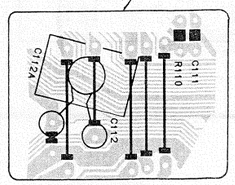
P203A
1
I
12
→ *To UF01 Terminal 1 PC Board, P203B*

(V-109F)



6 | – | 1 → *To U203 Connect U PC Board, W251*
W251

P202
1 | – | 8
→ *To UX01 Timer PC Board, WX03*



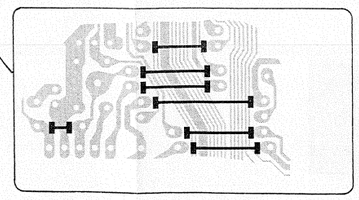
(V-159F)

W252
7 | – | 1
→ *To U203 Connect U PC Board, W252*

W253
5 | – | 1
→ *To U203 Connect U PC Board, W253 (V-259F/269F)*

W201
1 | – | 5
← *To U801 Power 1 PC Board, P807*

PE01
13 | – | 1
→ *To UE01 OSP PC Board, PE01 (V-259F/269F)*

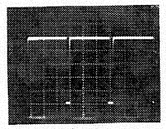


(V-159F)

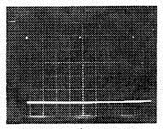
P401
1 | 2
→ *To UX01 Timer PC Board, WX13*

[ ] *parts are for V-259F/269F.*

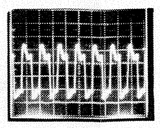
13-2. OSP Circuit (V-209F/259F/269F/490F)



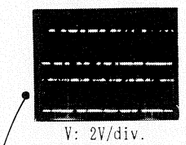
V: 1V/div.
H: 20 μs/div.



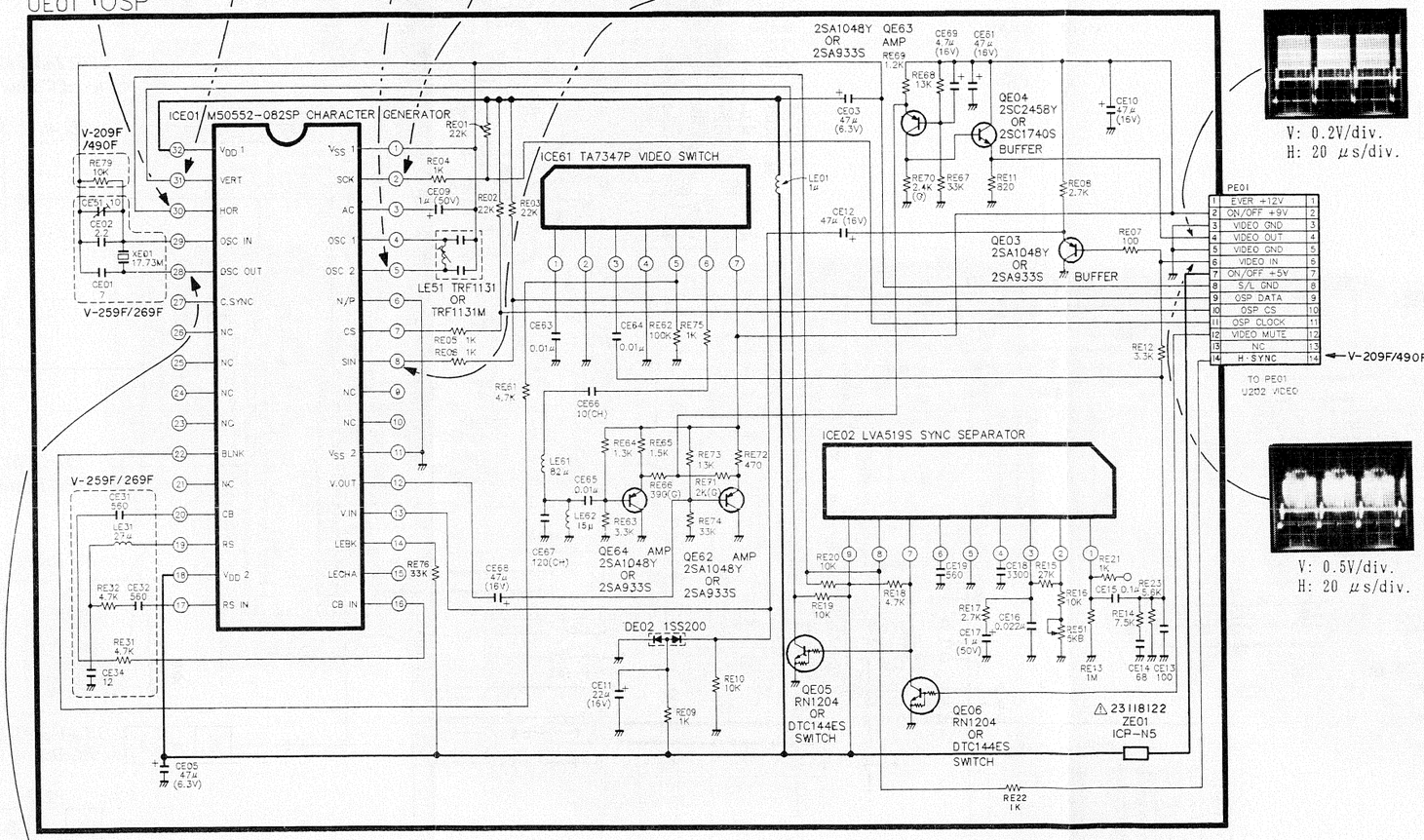
V: 1V/div.
H: 5ms/div.



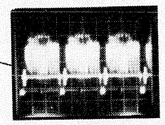
V: 1V/div.
H: 0.1μs/div.



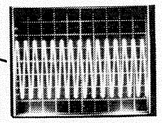
V: 2V/div.
H: 1ms/div.



V: 0.2V/div.
H: 20 μs/div.

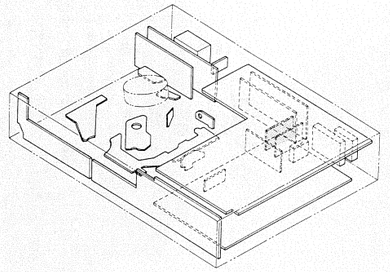


V: 0.5V/div.
H: 20 μs/div.



V: 1V/div.
H: 0.1μs/div.

13-3. OSP PC Board (V-209F/259F/269F/490F)



Location of Transistors

Symbol No.	Location
QE03	D-10(F-10)
QE04	D-9(F-9)
QE05	C-10(E-10)
QE06	D-10(F-10)
QE62	C-9(E-9)
QE63	C-9(F-9)
QE64	C-8(F-8)

( ):V-259F/269F

Location of ICs

Symbol No.	Location
ICE01	C-11(E-11)
ICE02	C-10(F-10)
ICE61	D-8(F-8)

( ):V-259F/269F

Location of Diode

Symbol No.	Location
DE02	D-10(F-10)

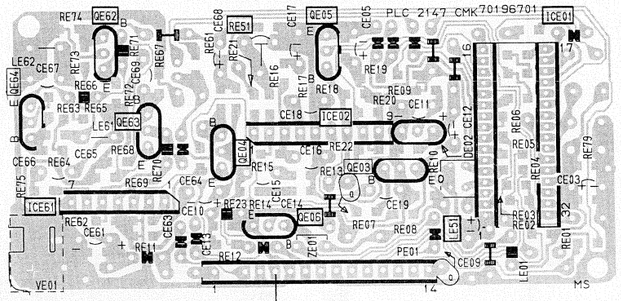
( ):V-259F/269F

Location of Adjusting VR

Symbol No.	Location
RE51	C-9(E-9)

( ):V-259F/269F

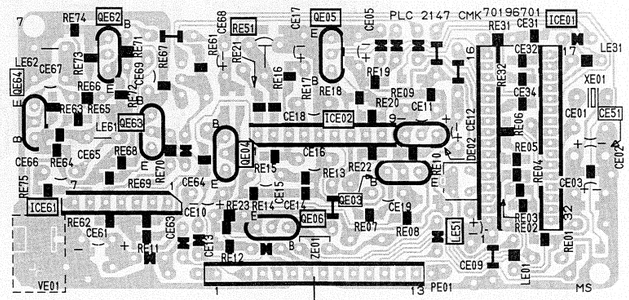
UE01 OSP PC Board (V-209F/490F)



1 – 14 → *To U202 Main PC Board, PE01*

PE01

UE01 OSP PC Board (V-259F/269F)



1 – 13 → *To U202 Main PC Board, PE01*

PE01

14-2. Audio PC Board

Voltage and Location of Transistors

V : REC (V) : PLAY

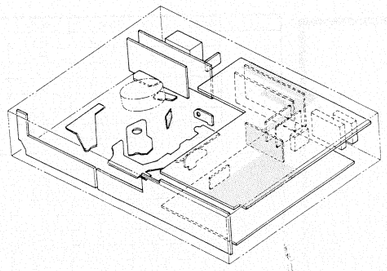
Symbol No.	Voltage(Unit:V) E	C	B	Location
Q702	0(0)	6.7(0)	-0.7(0)	C-6
Q731	0(0)	7.9(0)	0(4.1)	F-4

Location of ICs

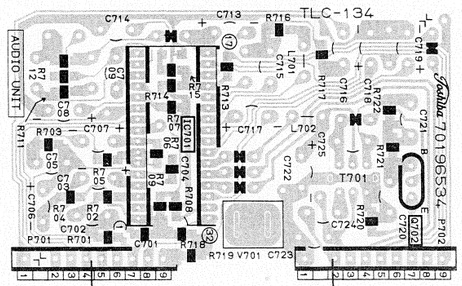
Symbol No.	Location
IC701	C-5

Location of Adjusting VRs

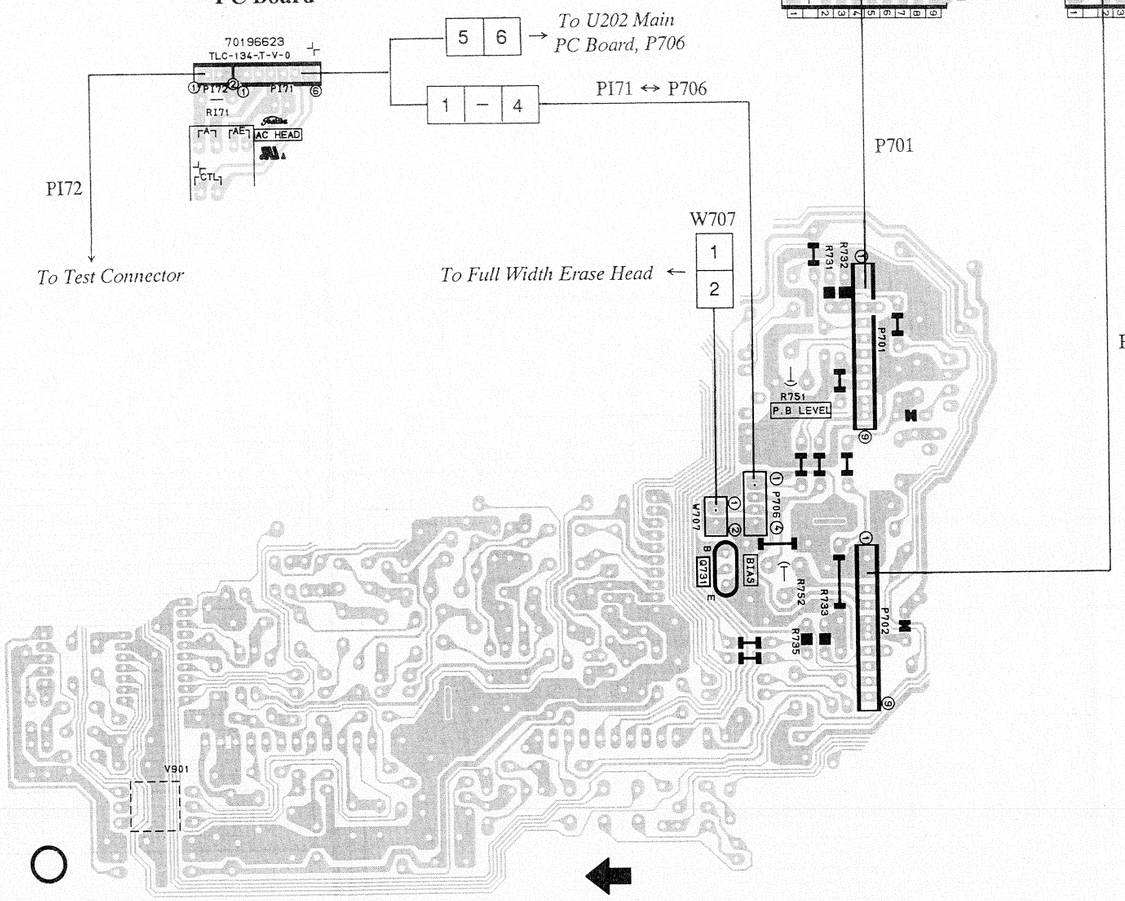
Symbol No.	Location
R751	E-4
R752	F-4



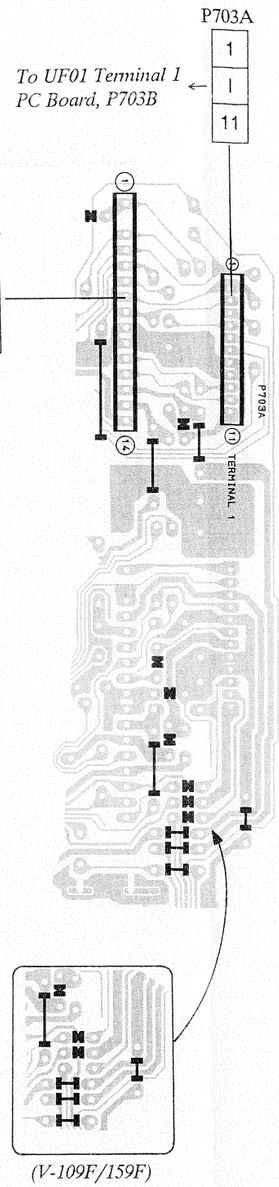
U701 Conventional Audio PC Board



UI07 ACE Head Relay PC Board

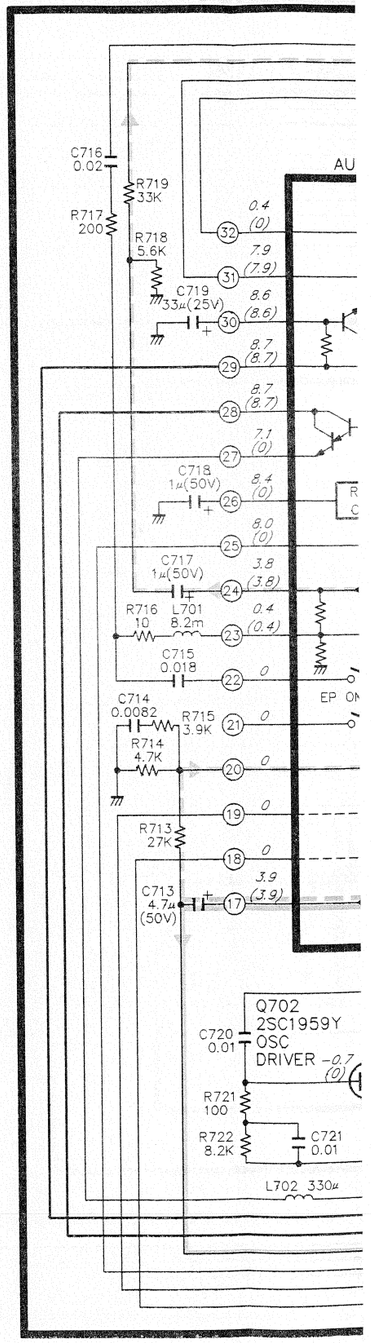


U202 Main (Audio) PC Board



(V-109F/159F)

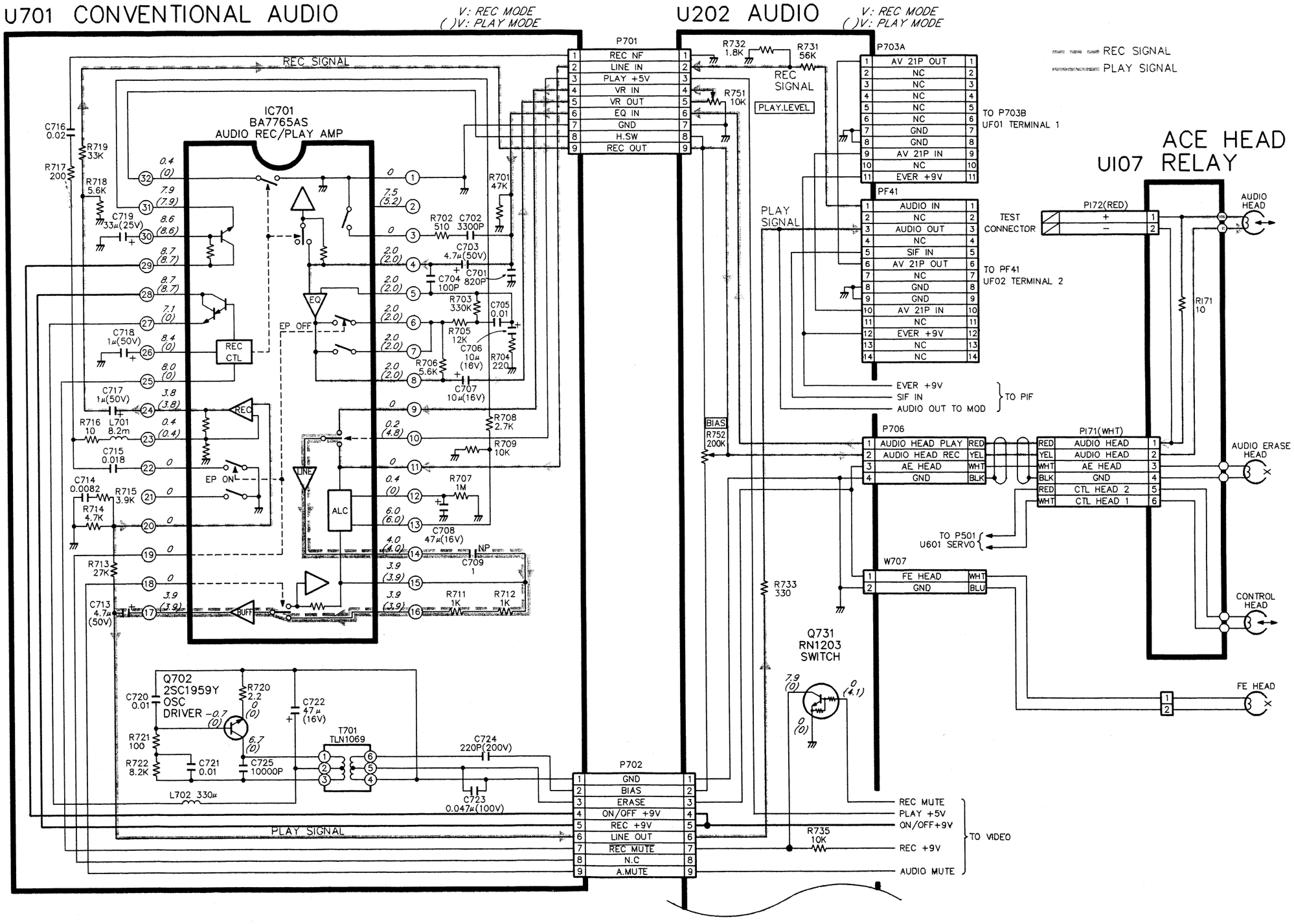
14-3. Audio Circuit



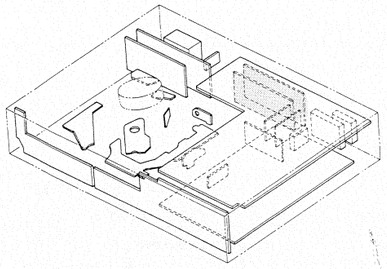
P703A
1
I
11
Terminal 1
, P703B

'159F)

14-3. Audio Circuit



15-1. Terminal PC Board



Voltage and Location of Transistors

V : LINE IN (V) : RF IN <V> : CANAL+IN [V] : PLAY <<V>> : TV CANAL+

Symbol No.	Voltage(Unit:V) E	C	B	Location
QF44	1.4	0	0.7	F-5
QF45	1.4	0	0.7	F-5
QF46	0(0)<0>[0]<<0>>	3.9(3.9)<0.1>[4.4]<<0.1>>	0(0)<1.6>[0]<<1.6>>	F-4
QF47	0(0)<0>[0]<<0>>	0(0)<0>[0]<<3.0>>	2.9(2.9)<2.6>[3.3]<<0>>	F-3
QF48	0(0)<0>[0]<<0>>	11.9(11.9)<11.9>[0]<<0>>	0(0)<0>[4.3]<<2.5>>	G-3
QF49	11.9(11.9)<11.9> [11.9]<<11.9>>	0(0)<0>[11.9]<<11.9>>	11.9(11.9)<11.9>[0]<<0>>	G-4
QF75	0(0)<->><<0>>	0(0)<->><<8.6>>	4.6(4.6)<->><<0>>	F-3
QF76	0(0)<->><<0>>	8.6(0)<->><<8.6>>	0(2.6)<->><<0>>	G-3
QF77	0(0)<->><<0>>	8.9(0)<->><<8.9>>	0(3.1)<->><<0>>	F-3

Location of ICs

Symbol No.	Location
ICF41	F-5
ICF42	F-4
ICF43	F-4
ICF71	F-2
ICF72	E-2
ICF73	F-2
ICF74	E-3

Location of Diodes

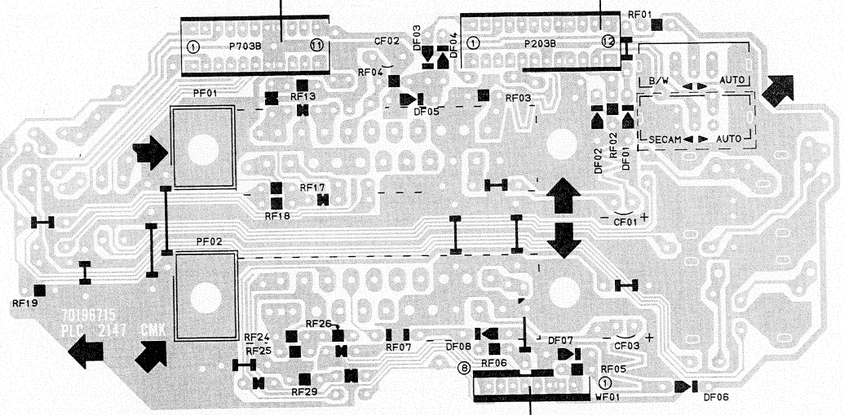
Symbol No.	Location
DF01	C-5
DF02	C-5
DF03	C-4
DF04	C-4
DF05	C-4
DF06	D-5
DF07	D-4
DF08	D-4
DF41	F-5
DF42	F-5
DF43	F-4
DF44	F-5
DF45	F-4
DF46	F-5
DF47	F-5
DF48	F-4
DF49	F-4
DF50	F-4
DF51	F-4
DF52	F-3
DF53	F-4
DF54	F-4
DF55	F-4
DF71	E-2
DF72	F-2
DF74	G-3
DF75	G-3

1 – 11 → *To U202 Main PC Board, P703A*

P703B

1 – 12 → *To To U202 Main PC Board, J'203A*

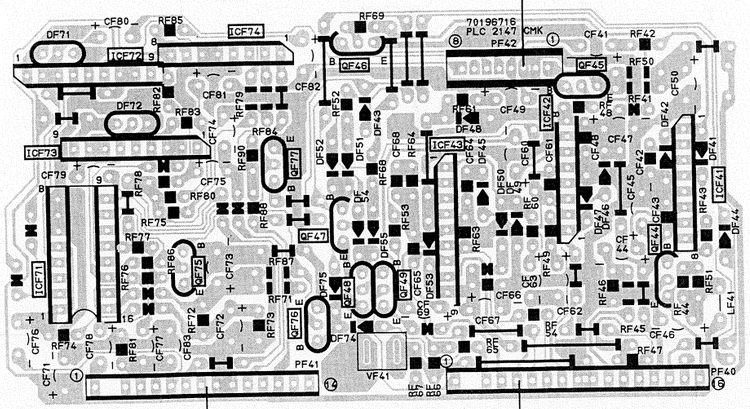
P203B



UF01 Terminal 1 PC Board

WF01
↕
PF42

UF02 Terminal 2 PC Board



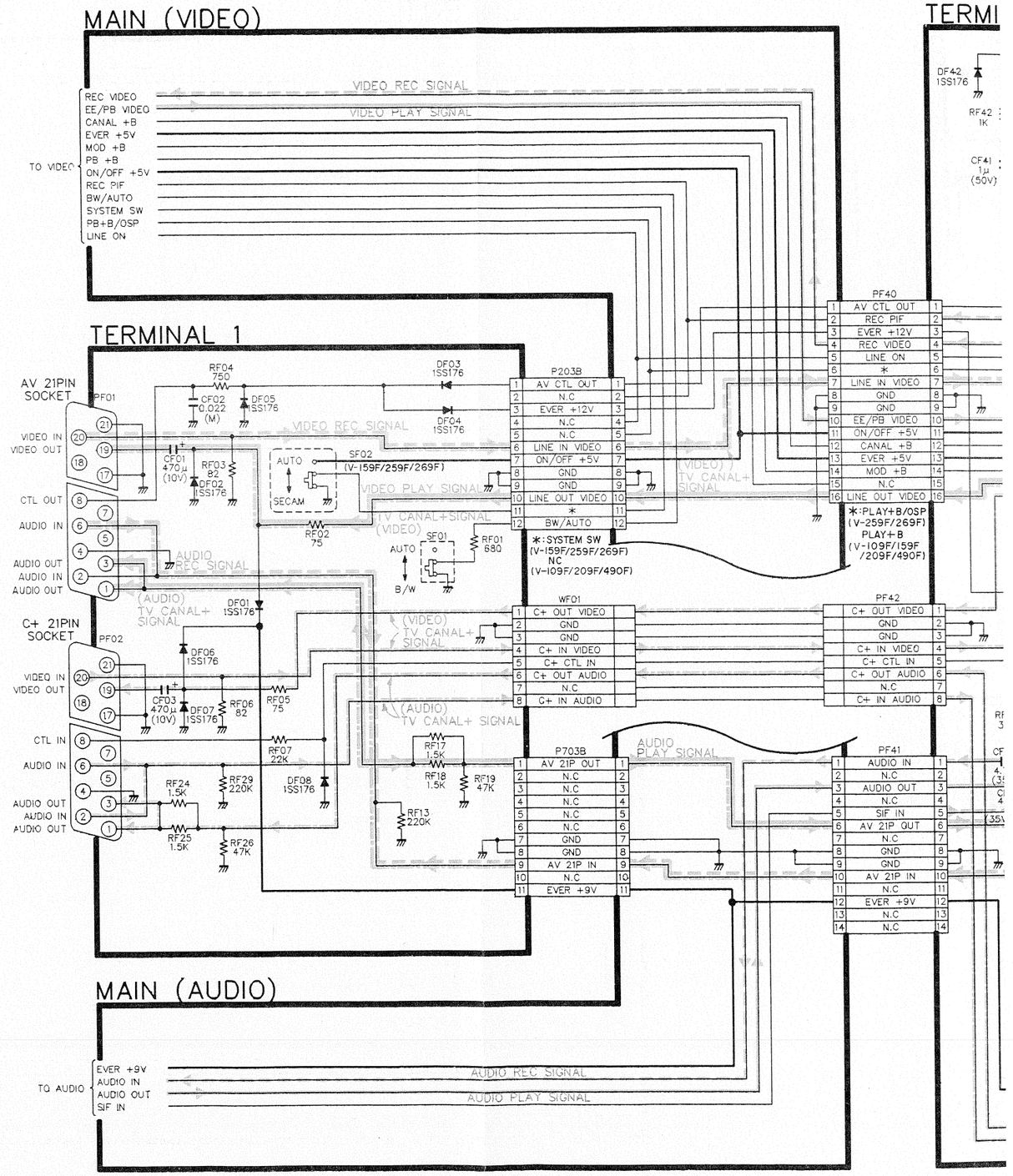
To U202 Main PC Board, PF41 ← 1 – 14

PF41

1 – 16 → *To U202 Main PC Board, PF40*

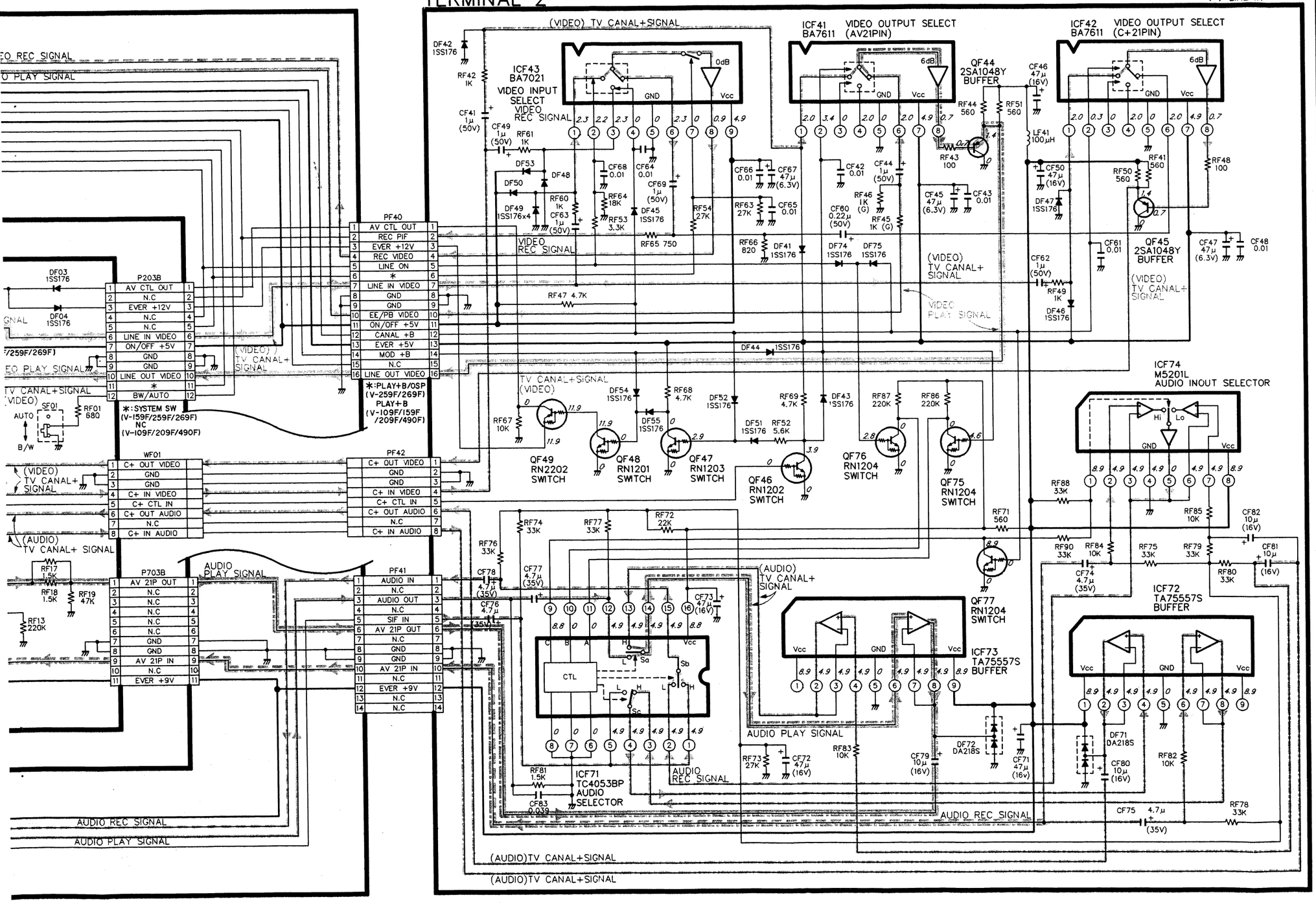
PF40

15-2. Terminal Circuit



TERMINAL 2

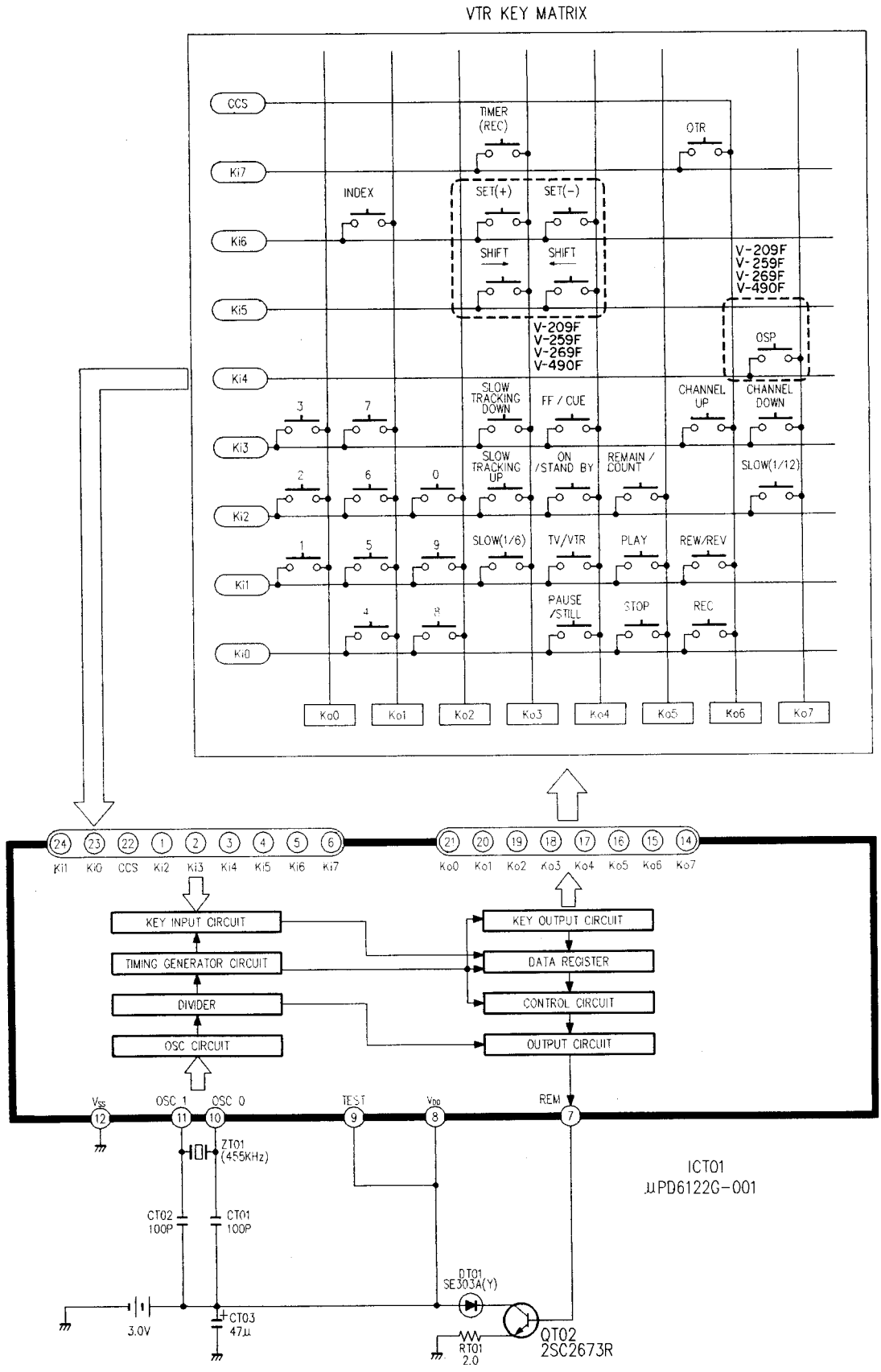
V : LINE IN



(V)

	AV No.	RF IN	CANAL+ IN	PLAY	TV CANAL+
ICF41	1	2.0	2.0	2.0	2.0
	2	3.4	3.4	4.5	0.2
	3	0	0	0	0
	4	2.0	2.0	2.0	2.0
	5	0	0	0	0
	6	2.0	2.0	2.0	2.0
	7	4.3	4.9	4.9	4.9
	8	0.7	0.7	0.7	0.7
ICF42	1	2.0	2.0	2.0	2.0
	2	0.3	3.3	0.3	0
	3	0	0	0	0
	4	2.0	2.0	2.0	2.0
	5	0	0	0	0
	6	2.0	2.0	2.0	2.0
	7	4.9	4.9	4.9	4.9
	8	0.7	0.7	0.7	0.7
ICF43	1	2.3	2.3	2.3	2.3
	2	0	0	2.2 or 0	0
	3	2.3	2.3	2.3	2.3
	4	0	0	2.7	0
	5	0	0	0	0
	6	2.3	2.3	2.3	2.3
	7	0	0	4.0	0
	8	0.9	0.9	0.9	0
	9	4.9	4.9	4.9	0
ICF71	1	4.9	4.9		4.9
	2	4.9	4.9		4.9
	3	4.9	4.9		4.9
	4	4.9	4.9		4.9
	5	4.9	4.9		4.9
	6	0	0		0
	7	0	0		0
	8	0	0		0
	9	8.8	0		8.8
	10	8.6	0		8.6
	11	0	0		8.6
	12	4.9	4.9		4.9
	13	4.9	4.9		4.9
	14	4.9	4.9		4.9
	15	4.9	4.9		4.9
	16	8.8	8.8		8.8
ICF71	1	8.9	6.6		8.9
	2	4.9	4.9		4.9
	3	4.9	4.9		4.9
	4	4.9	4.9		4.9
	5	0	0		0
	6	4.9	4.9		4.5
	7	4.9	4.9		4.9
	8	8.9	8.9		8.9
QF46	E	0	0	0	0
	C	3.9	0.1	4.4	0.1
	B	0	1.6	0	1.6
QF47	E	0	0	0	0
	C	0	0	0	3.0
	B	2.9	2.6	3.3	0
QF48	E	0	0	0	0
	C	11.9	11.9	0	0
	B	0	0	4.3	2.5
QF49	E	11.9	11.9	11.9	11.9
	C	0	0	11.9	11.9
	B	11.9	11.9	0	0
QF75	E	0	0		0
	C	0	0		8.6
	B	4.6	4.6		0
QF76	E	0	0		0
	C	8.6	0		8.6
	B	0	2.6		0
QF77	E	0	0		0
	C	8.9	0		8.9
	B	0	3.1		0

16. Remote Control Circuit



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SECTION 4
PARTS LIST

SAFETY PRECAUTION

The parts identified by ⚠ mark are critical for safety. Replace only with part number specified.
The mounting position of replacement is to be identical with originals. The substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

NOTICE

The part number must be used when ordering parts in order to assist in processing, be sure to include the model number and description.
Parts marked # are of chip type and mounted on original PC boards.
However, when they are placed for servicing works, use discrete parts listed on the parts list.

a = V-109F, b = V-159F, c = V-209F, d = V-259F, e = V-269F, f = V-490F

ABBREVIATIONS

1. **Integrated circuit (IC)**
2. **Capacitor (Cap)**

- **Unit**

		Ex.
F	farad	
MF	microfarad ($\mu F = 10^{-6}F$)	10MF = 10μF
PF	picofarad ($pF = 10^{-6}\mu F = 10^{-12}F$)	10PF = 10pF

- **Capacitance tolerance (for nominal capacitance higher than 10pF)**

Symbol	**B**	**C**	**D**	**F**	**G**	**J**	**K**	**M**	**N**
Tolerance %	±0.1	±0.25	±0.5	±1	±2	±5	±10	±20	±30

Symbol	**P**	**Q**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
Tolerance %	+100 0	+30 −10	+50 −10	+75 −10	+20 −10	+100 −10	+40 −20	+150 −10	+80 −20

Ex. 10MF J = 10μF ±5%

- **Capacitance tolerance (for nominal capacitance lower than 10pF)**

Symbol	**B**	**C**	**D**	**F**	**G**
Tolerance pF	±0.1	±0.25	±0.5	±1	±2

Ex. 10PF G = 10pF ± 2pF

3. **Resistor (Res)**

- **Unit**

		Ex.	
No Mark	Ω	10	10Ω
K	kΩ	10K	10kΩ
M	MΩ	10M	10MΩ
W	Watt	1W	1 Watt

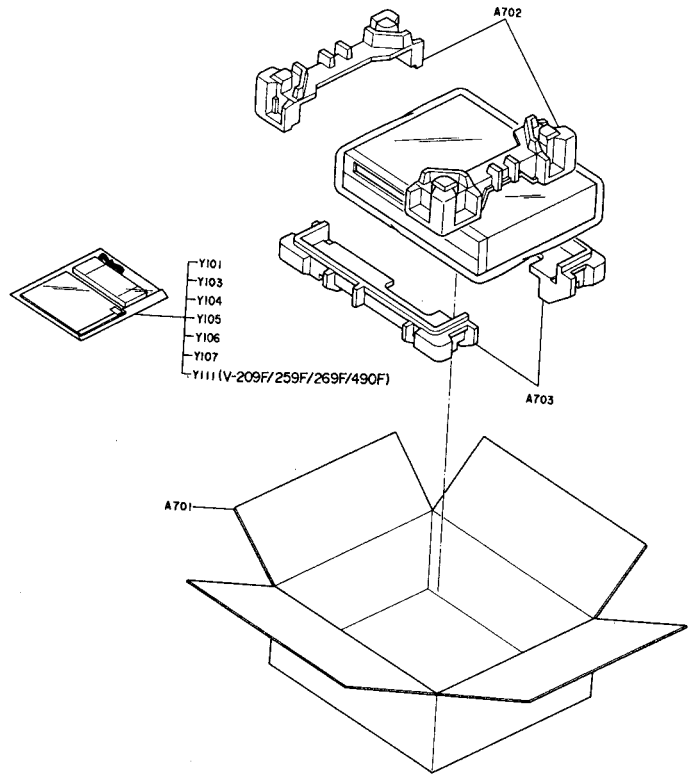
- **Resistance tolerance**

Symbol	**B**	**C**	**D**	**F**	**G**	**J**	**K**	**M**
Tolerance %	±0.1	±0.25	±0.5	±1	±2	±5	±10	±20

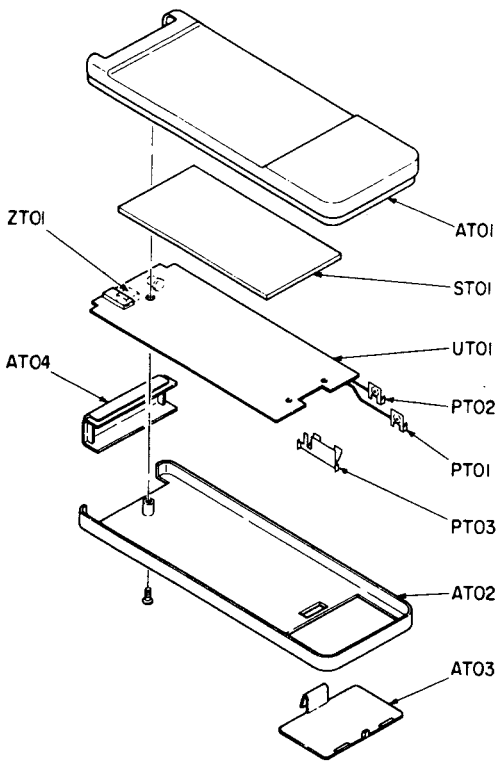
Ex. 470 J = 470Ω ± 5%

1. EXPLODED VIEWS

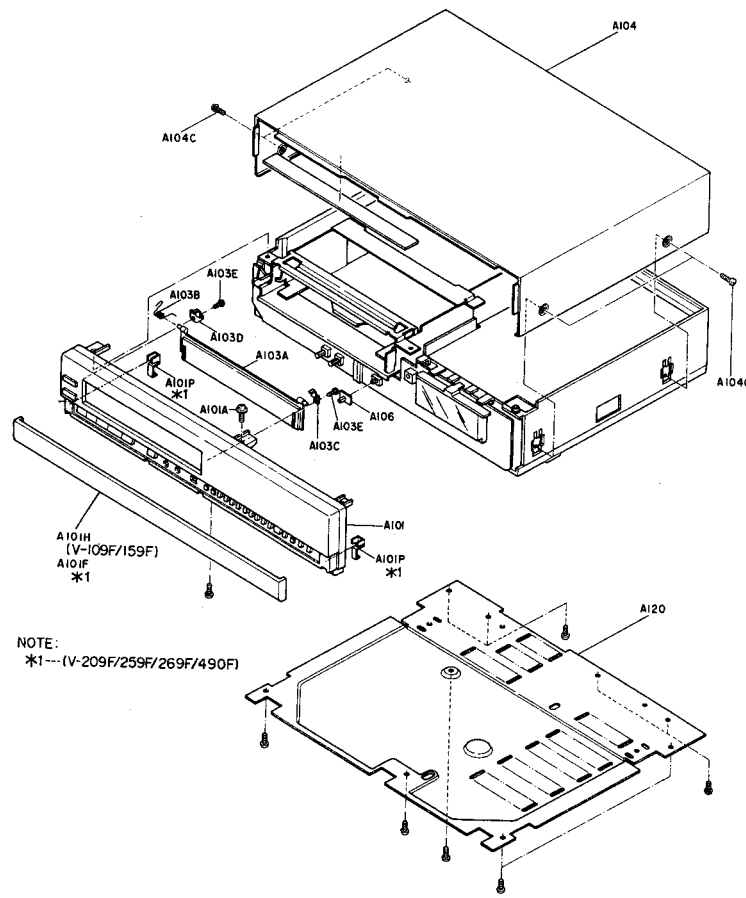
(1) Packing Assembly



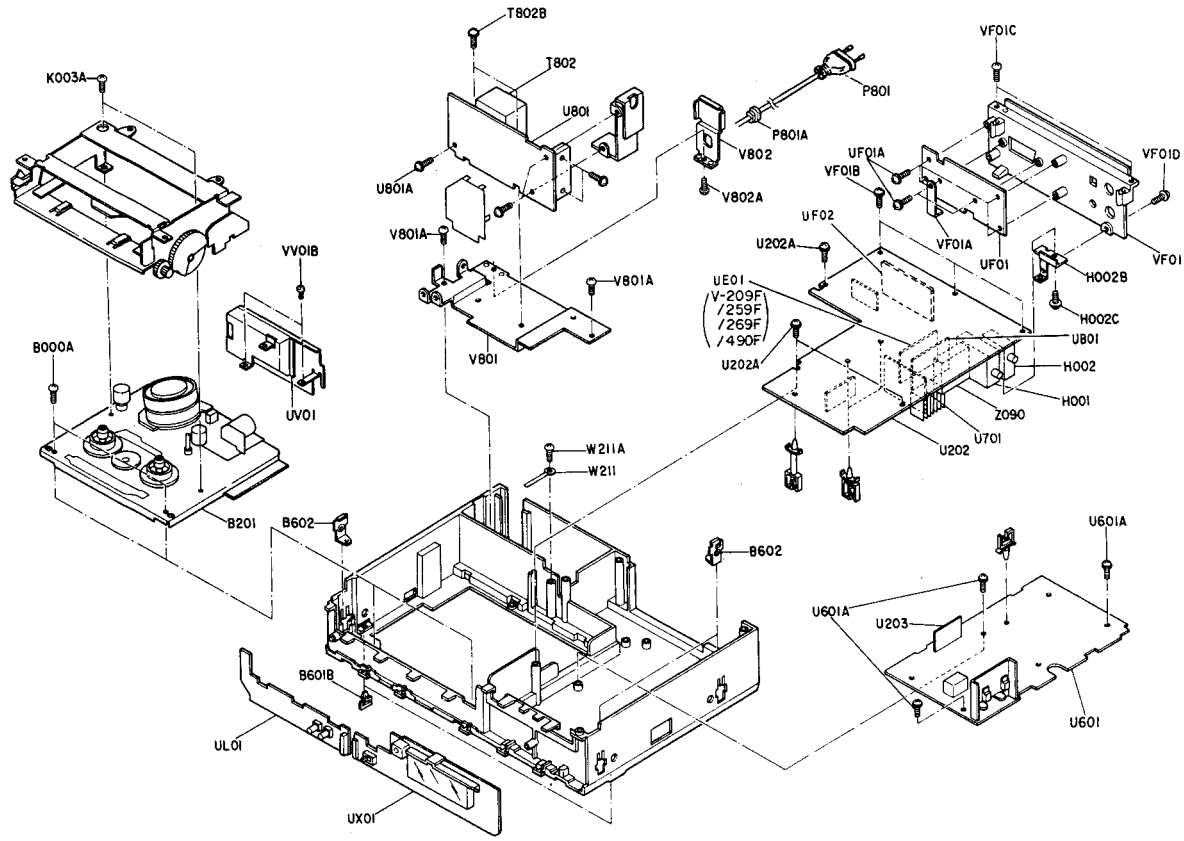
(2) Remote Control Unit



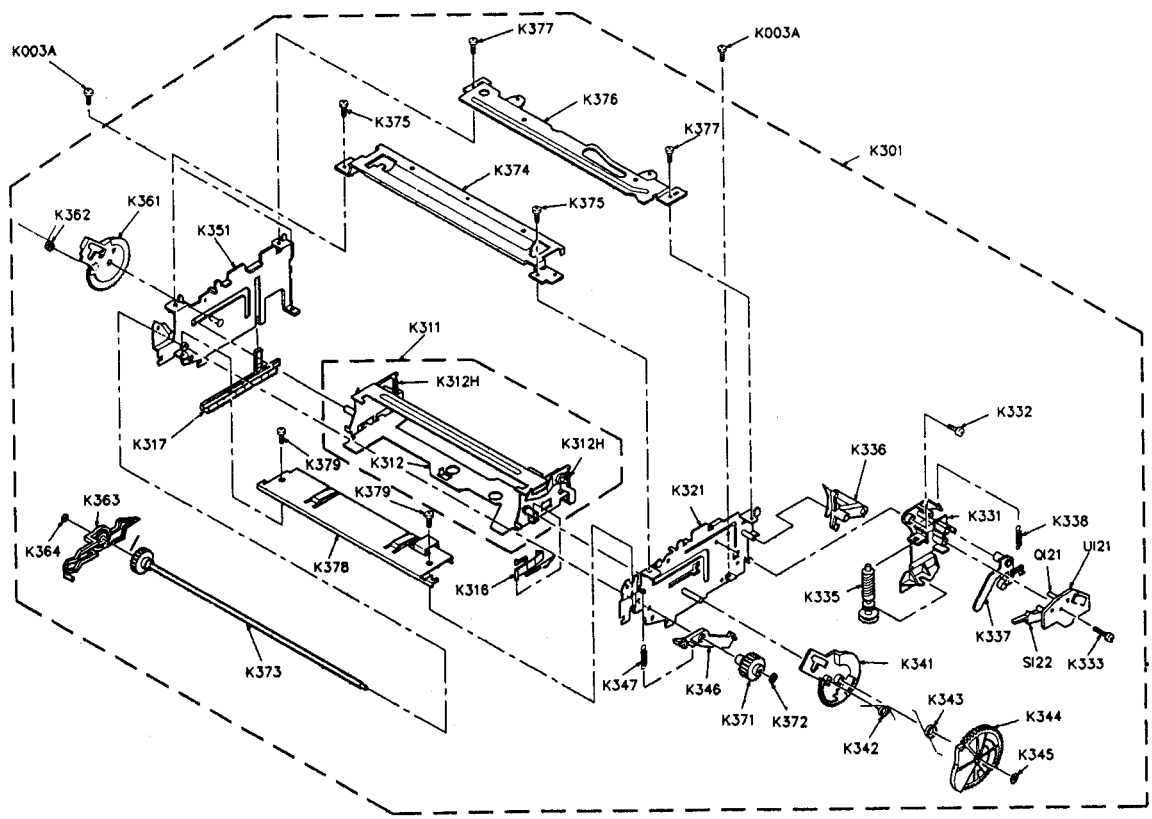
(3) Cabinet Assembly



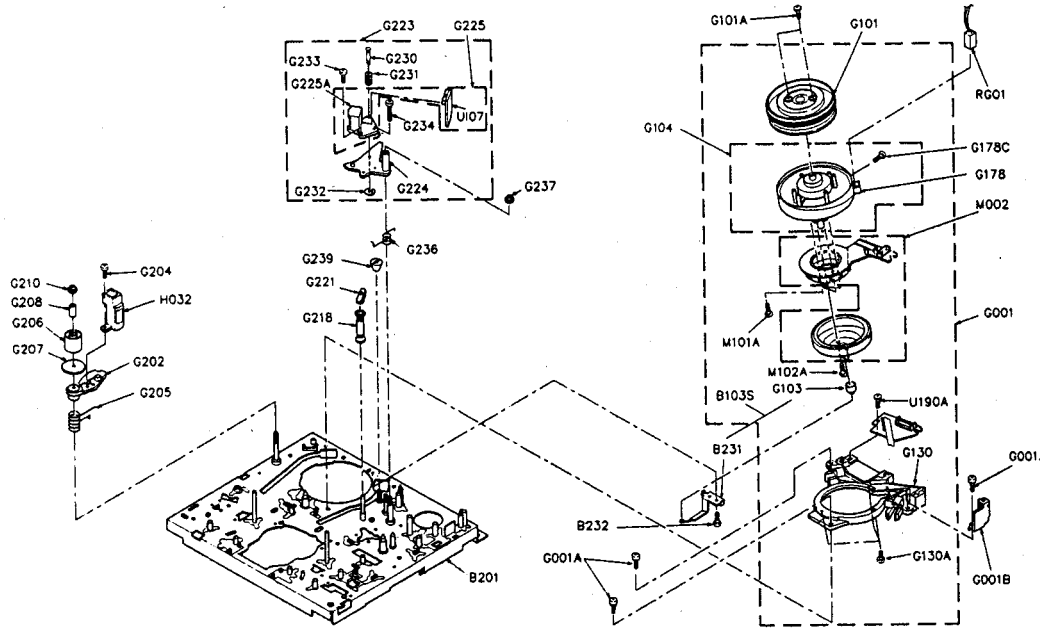
(4) Chassis Assembly



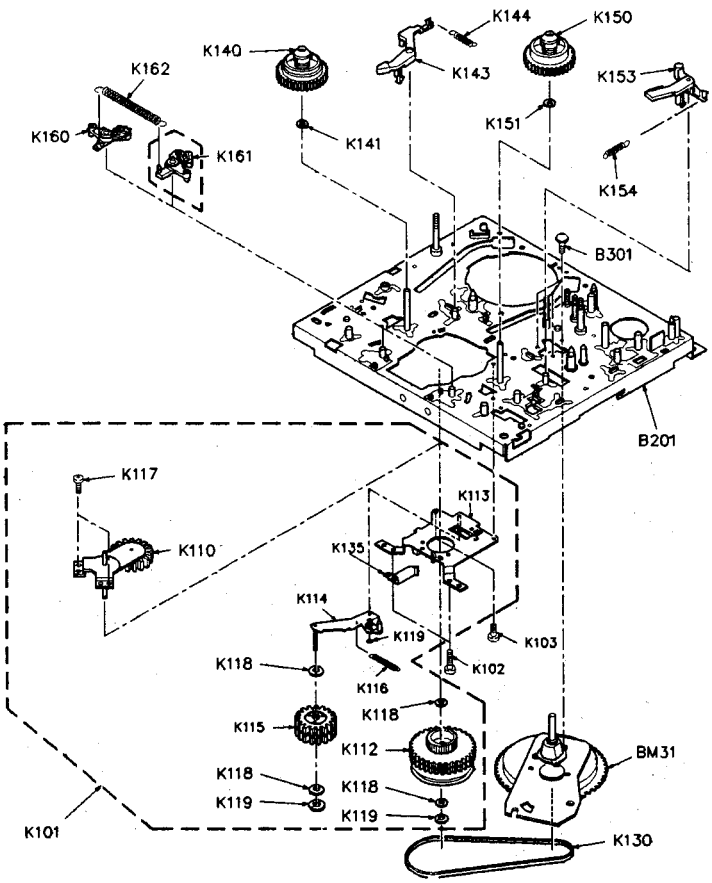
(5) Cassette Holder Assembly



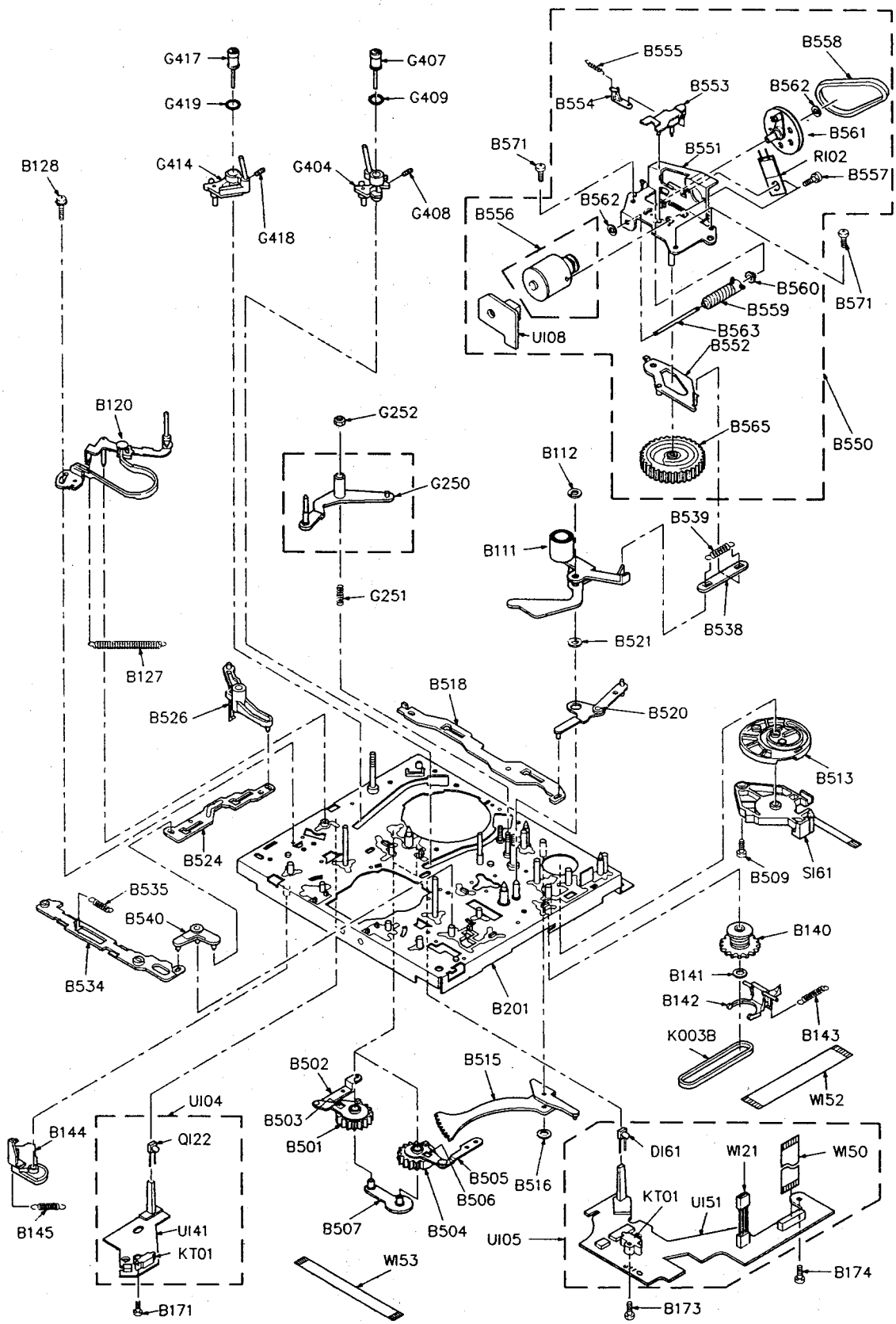
(6) Mechanical Parts (1)



(7) Mechanical Parts (2)



(8) Mechanical Parts (3)



2. PARTS LIST

ELECTRICAL PARTS

	LOCATION NUMBER	PART NUMBER	DESCRIPTION		
a	U202	70188276	P C Board Assy, MAIN		
c	U202	70188269	P C Board Assy, MAIN		
f	U202	70188269	P C Board Assy, MAIN		
			- INTEGRATED CIRCUIT -		
	IC201	70128037	IC	MSM6965-3RS	
	IC291	70128180	IC	BA7259AK	
	IC831	23318768	IC	AN7809F	
	Z201	70128199	IC, Hybrid	THB89YP	
			- TRANSISTORS -		
	Q081	A6332440	Transistor	2SC2458-GR	
	Q082	A6546320	Transistor	2SA1297GR	
	Q083	A6546310	Transistor	2SA1297Y	
	Q084	A6012010	Transistor	RN2201	
	Q085	A6002020	Transistor	RN1202	
	Q101	A6332430	Transistor	2SC2458-Y	
	Q102	A6332430	Transistor	2SC2458-Y	
	Q202	A6534430	Transistor	2SA1048-Y	
	Q203	A6002040	Transistor	RN1204	
	Q204	A6332430	Transistor	2SC2458-Y	
c	Q205	A6012030	Transistor	RN2203	
f	Q205	A6012030	Transistor	RN2203	
	Q206	A6012020	Transistor	RN2202	
	Q207	A6002040	Transistor	RN1204	
	Q210	A6002040	Transistor	RN1204	
	Q211	A6012040	Transistor	RN2204	
c	Q214	A6002040	Transistor	RN1204	
f	Q214	A6002040	Transistor	RN1204	
	Q281	A6325549	Transistor	2SC2236-Y	
	Q301	A6534430	Transistor	2SA1048-Y	
	Q302	A6332430	Transistor	2SC2458-Y	
	Q481	A6332430	Transistor	2SC2458-Y	
	Q731	A6002030	Transistor	RN1203	
			- DIODES -		
	D082	A7160570	Diode	1SS176	
			- COILS -		
	L101	23237975	Coil, Peaking	TRF4101AC	
	L102	23237980	Coil, Peaking	TRF4390AC	
	L103	23237971	Coil, Peaking	TRF4221AC	
	L104	23237985	Coil, Peaking	TRF4150AC	
	L105	23237980	Coil, Peaking	TRF4390AC	
	L201	23238910	Coil, Peaking	TRF4101AC	
	L202	23238910	Coil, Peaking	TRF4101AC	
	L204	23238914	Coil, Peaking	TRF4470AC	
	L205	23238913	Coil, Peaking	TRF4560AC	
	L206	23237980	Coil, Peaking	TRF4390AC	
	L207	23237977	Coil, Peaking	TRF4680AC	
	L208	23238916	Coil, Peaking	TRF4330AC	
			- CAPACITORS -		
	C071	24203220	Cap, Electrolytic	22MF	M 16V
	C072	24474103	Cap, Ceramic	0. 01MF	N 50V
	C073	24203101	Cap, Electrolytic	100MF	M 16V
	C074	24474103	Cap, Ceramic	0. 01MF	N 50V
	C075	24203220	Cap, Electrolytic	22MF	M 16V
	C076	24474103	Cap, Ceramic	0. 01MF	N 50V
	C079	24797470	Cap, Electrolytic	47MF	M 50V
	C081	24203100	Cap, Electrolytic	10MF	M 16V
	C082	24203100	Cap, Electrolytic	10MF	M 16V
	C084	24203220	Cap, Electrolytic	22MF	M 16V
	C101	24474103	Cap, Ceramic	0. 01MF	N 50V
	C102	24201470	Cap, Electrolytic	47MF	M 6. 3V
	C103	24436181	Cap, Ceramic	180PF	J 50V
	C104	24473399	Cap, Ceramic	3. 9PF	K 50V
	C105	24473689	Cap, Ceramic	6. 8PF	K 50V
	C106	24473150	Cap, Ceramic	15PF	J 50V
	C107	24436331	Cap, Ceramic	330PF	J 50V
	C108	24473560	Cap, Ceramic	56PF	J 50V
	C109	24851333	Cap, Ceramic	0. 033MF	K 25V
	C110	24474103	Cap, Ceramic	0. 01MF	N 50V
	C111	24474103	Cap, Ceramic	0. 01MF	N 50V
	C112	24436221	Cap, Ceramic	220PF	J 50V
	C201	24474103	Cap, Ceramic	0. 01MF	N 50V
	C202	24474103	Cap, Ceramic	0. 01MF	N 50V
	C203	24205479	Cap, Electrolytic	4. 7MF	M 35V
	C204	24474103	Cap, Ceramic	0. 01MF	N 50V
	C205	24794470	Cap, Electrolytic	47MF	M 16V
	C206	24474103	Cap, Ceramic	0. 01MF	N 50V
	C207	24201470	Cap, Electrolytic	47MF	M 6. 3V
	C208	24473470	Cap, Ceramic	47PF	J 50V
	C209	24436101	Cap, Ceramic	100PF	J 50V
	C210	24473560	Cap, Ceramic	56PF	J 50V
	C211	24473399	Cap, Ceramic	3. 9PF	K 50V
	C212	24201220	Cap, Electrolytic	22MF	M 6. 3V
	C213	24201220	Cap, Electrolytic	22MF	M 6. 3V
	C214	24473680	Cap, Ceramic	68PF	J 50V
	C215	24201220	Cap, Electrolytic	22MF	M 6. 3V
	C216	24085973	Cap, Electrolytic	0. 47MF	M 50V
	C217	24206339	Cap, Electrolytic	3. 3MF	M 50V
	C218	24201470	Cap, Electrolytic	47MF	M 6. 3V
	C219	24436471	Cap, Ceramic	470PF	J 50V
	C220	24793221	Cap, Electrolytic	220MF	M 10V
	C221	24206228	Cap, Electrolytic	0. 22MF	M 50V
	C222	24201220	Cap, Electrolytic	22MF	M 6. 3V
	C223	24205479	Cap, Electrolytic	4. 7MF	M 35V
	C224	24205479	Cap, Electrolytic	4. 7MF	M 35V
	C232	24474103	Cap, Ceramic	0. 01MF	N 50V
	C281	24632470	Cap, Electrolytic	47MF	M 10V
	C301	24436181	Cap, Ceramic	180PF	J 50V
c	C302	24473680	Cap, Ceramic	68PF	J 50V
f	C302	24473680	Cap, Ceramic	68PF	J 50V
	C303	24202101	Cap, Electrolytic	100MF	M 10V
	C481	24474103	Cap, Ceramic	0. 01MF	N 50V
	C831	24206010	Cap, Electrolytic	1MF	M 50V
	C832	24795330	Cap, Electrolytic	33MF	M 25V
			- RESISTORS -		
	R071	24366103	Res, Carbon	10K	J 1/6W
	R073	24366472	Res, Carbon	4. 7K	J 1/6W
	R075	24366472	Res, Carbon	4. 7K	J 1/6W
	R081	24366681	Res, Carbon	680	J 1/6W
	R082	24366681	Res, Carbon	680	J 1/6W
	R083	24366103	Res, Carbon	10K	J 1/6W
	R084	24366152	Res, Carbon	1. 5K	J 1/6W
	R085	24366103	Res, Carbon	10K	J 1/6W
	R101	24366102	Res, Carbon	1K	J 1/6W
	R102	24367472	Res, Carbon	4. 7K	G 1/6W
	R103	24367122	Res, Carbon	1. 2K	G 1/6W
	R104	24366151	Res, Carbon	150	J 1/6W
	R105	24367122	Res, Carbon	1. 2K	G 1/6W
	R106	24366271	Res, Carbon	270	J 1/6W
	R107	24366391	Res, Carbon	390	J 1/6W
	R108	24366152	Res, Carbon	1. 5K	J 1/6W
	R109	24366101	Res, Carbon	100	J 1/6W
	R110	24366472	Res, Carbon	4. 7K	J 1/6W
	R201	24366102	Res, Carbon	1K	J 1/6W
	R202	24366821	Res, Carbon	820	J 1/6W
	R203	24000952	Res, Thermistor	3K	
	R204	24366151	Res, Carbon	150	J 1/6W
	R205	24366272	Res, Carbon	2. 7K	J 1/6W
	R206	24366391	Res, Carbon	390	J 1/6W
	R207	24366183	Res, Carbon	18K	J 1/6W
	R208	24366183	Res, Carbon	18K	J 1/6W
	R209	24367102	Res, Carbon	1K	G 1/6W
	R210	24367122	Res, Carbon	1. 2K	G 1/6W
	R211	24366122	Res, Carbon	1. 2K	J 1/6W
	R213	24366122	Res, Carbon	1. 2K	J 1/6W
	R214	24366472	Res, Carbon	4. 7K	J 1/6W
	R215	24366563	Res, Carbon	56K	J 1/6W
c	R215	24366513	Res, Carbon	51K	J 1/6W
f	R215	24366513	Res, Carbon	51K	J 1/6W
c	R216	24366102	Res, Carbon	1K	J 1/6W
f	R216	24366102	Res, Carbon	1K	J 1/6W
c	R217	24366392	Res, Carbon	3. 9K	J 1/6W
f	R217	24366392	Res, Carbon	3. 9K	J 1/6W
	R219	24366182	Res, Carbon	1. 8K	J 1/6W
	R257	24066955	Res, Variable	1K	
	R259	24066953	Res, Variable	100K	
	R281	24366471	Res, Carbon	470	J 1/6W
	R301	24366101	Res, Carbon	100	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
R302	24366561	Res, Carbon	560	J 1/6W
R303	24366391	Res, Carbon	390	J 1/6W
R304	24367331	Res, Carbon	330	G 1/6W
R305	24367331	Res, Carbon	330	G 1/6W
R306	24366222	Res, Carbon	2. 2K	J 1/6W
R307	24366102	Res, Carbon	1K	J 1/6W
R481	24366101	Res, Carbon	100	J 1/6W
R482	24366303	Res, Carbon	30K	J 1/6W
R483	24366103	Res, Carbon	10K	J 1/6W
R484	24366681	Res, Carbon	680	J 1/6W
R485	24366302	Res, Carbon	3K	J 1/6W
R558	24066604	Res, Variable	200K	
R731	24366563	Res, Carbon	56K	J 1/6W
R732	24366182	Res, Carbon	1. 8K	J 1/6W
R733	24366331	Res, Carbon	330	J 1/6W
R735	24366103	Res, Carbon	10K	J 1/6W
R751	24066952	Res, Variable	10K	
R752	24066948	Res, Variable	200K	
		- MISCELLANEOUS -		
P203A	23367203	Plug, 12P		
P703A	23367202	Plug, 11P		
Q831B	70391355	Screw, 3x8mm		
Z090	70137189	F.U, VIF-F-01		
Z202	23107631	Filter, 3.2MHz, TLC1126N		
Z481	70137183	F.U., HSC-102		
b U202	70188303	P C Board Assy, MAIN		
		- INTEGRATED CIRCUIT -		
IC201	70128037	IC	MSM6965-3RS	
IC291	70128180	IC	BA7259AK	
IC461	70119858	IC	LA7311	
IC491	B0379295	IC	TA8632F	
IC831	23318768	IC	AN7809F	
Z201	70128199	IC, Hybrid	THB89YP	
Z401	70128048	IC, Hybrid	THB88CP	
		- TRANSISTORS -		
Q081	A6332440	Transistor	2SC2458-GR	
Q082	A6546320	Transistor	2SA1297GR	
Q083	A6546310	Transistor	2SA1297Y	
Q084	A6012010	Transistor	RN2201	
Q085	A6002020	Transistor	RN1202	
Q086	A6002060	Transistor	RN1206	
Q101	A6332430	Transistor	2SC2458-Y	
Q102	A6332430	Transistor	2SC2458-Y	
Q181	A6002040	Transistor	RN1204	
Q202	A6534430	Transistor	2SA1048-Y	
Q203	A6002040	Transistor	RN1204	
Q204	A6332430	Transistor	2SC2458-Y	
Q205	A6012030	Transistor	RN2203	
Q206	A6012020	Transistor	RN2202	
Q207	A6002040	Transistor	RN1204	
Q210	A6002040	Transistor	RN1204	
Q211	A6012040	Transistor	RN2204	
Q281	A6325549	Transistor	2SC2236-Y	
Q301	A6534430	Transistor	2SA1048-Y	
Q302	A6332430	Transistor	2SC2458-Y	
Q403	A6332430	Transistor	2SC2458-Y	
Q404	A6534430	Transistor	2SA1048-Y	
Q405	A6534430	Transistor	2SA1048-Y	
Q406	A6534430	Transistor	2SA1048-Y	
Q407	A6534430	Transistor	2SA1048-Y	
Q409	A6002040	Transistor	RN1204	
Q481	A6332430	Transistor	2SC2458-Y	
Q482	A6332430	Transistor	2SC2458-Y	
Q483	A6002040	Transistor	RN1204	
Q731	A6002030	Transistor	RN1203	
		- DIODES -		
D082	A7160570	Diode	1SS176	
D461	A7151450	Diode	1SS200	
D481	A7160570	Diode	1SS176	
		- COILS -		
L101	23237975	Coil, Peaking	TRF4101AC	
L102	23237980	Coil, Peaking	TRF4390AC	
L103	23237971	Coil, Peaking	TRF4221AC	
L104	23237985	Coil, Peaking	TRF4150AC	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
L105	23237980	Coil, Peaking	TRF4390AC	
L201	23238910	Coil, Peaking	TRF4101AC	
L202	23238910	Coil, Peaking	TRF4101AC	
L204	23238914	Coil, Peaking	TRF4470AC	
L205	23238913	Coil, Peaking	TRF4560AC	
L206	23237980	Coil, Peaking	TRF4390AC	
L207	23237977	Coil, Peaking	TRF4680AC	
L208	23238916	Coil, Peaking	TRF4330AC	
L401	23237985	Coil, Peaking	TRF4150AC	
L402	23237977	Coil, Peaking	TRF4680AC	
L403	23237971	Coil, Peaking	TRF4221AC	
L404	23237817	Coil, Peaking	TRF4681AC	
L405	23237967	Coil, Peaking	TRF4471AC	
L406	23237989	Coil, Peaking	TRF4689AC	
L407	23237984	Coil, Peaking	TRF4180AC	
		- CAPACITORS -		
C071	24203220	Cap, Electrolytic	22MF	M 16V
C072	24474103	Cap, Ceramic	0. 01MF	N 50V
C073	24203101	Cap, Electrolytic	100MF	M 16V
C074	24474103	Cap, Ceramic	0. 01MF	N 50V
C075	24203220	Cap, Electrolytic	22MF	M 16V
C076	24474103	Cap, Ceramic	0. 01MF	N 50V
C079	24797470	Cap, Electrolytic	47MF	M 50V
C081	24203100	Cap, Electrolytic	10MF	M 16V
C082	24203100	Cap, Electrolytic	10MF	M 16V
C084	24203220	Cap, Electrolytic	22MF	M 16V
C101	24474103	Cap, Ceramic	0. 01MF	N 50V
C102	24201470	Cap, Electrolytic	47MF	M 6. 3V
C103	24436181	Cap, Ceramic	180PF	J 50V
C104	24473399	Cap, Ceramic	3. 9PF	K 50V
C105	24473689	Cap, Ceramic	6. 8PF	K 50V
C106	24473150	Cap, Ceramic	15PF	J 50V
C107	24436331	Cap, Ceramic	330PF	J 50V
C108	24473560	Cap, Ceramic	56PF	J 50V
C109	24851333	Cap, Ceramic	0. 033MF	K 25V
C110	24474103	Cap, Ceramic	0. 01MF	N 50V
C111	24474103	Cap, Ceramic	0. 01MF	N 50V
C112	24436221	Cap, Ceramic	220PF	J 50V
C181	24436681	Cap, Ceramic	680PF	J 50V
C201	24474103	Cap, Ceramic	0. 01MF	N 50V
C202	24474103	Cap, Ceramic	0. 01MF	N 50V
C203	24205479	Cap, Electrolytic	4. 7MF	M 35V
C204	24474103	Cap, Ceramic	0. 01MF	N 50V
C205	24794470	Cap, Electrolytic	47MF	M 16V
C206	24474103	Cap, Ceramic	0. 01MF	N 50V
C207	24201470	Cap, Electrolytic	47MF	M 6. 3V
C208	24473470	Cap, Ceramic	47PF	J 50V
C209	24436101	Cap, Ceramic	100PF	J 50V
C210	24473560	Cap, Ceramic	56PF	J 50V
C211	24473399	Cap, Ceramic	3. 9PF	K 50V
C212	24201220	Cap, Electrolytic	22MF	M 6. 3V
C213	24201220	Cap, Electrolytic	22MF	M 6. 3V
C214	24473680	Cap, Ceramic	68PF	J 50V
C215	24201220	Cap, Electrolytic	22MF	M 6. 3V
C216	24085973	Cap, Electrolytic	0. 47MF	M 50V
C217	24206339	Cap, Electrolytic	3. 3MF	M 50V
C218	24201470	Cap, Electrolytic	47MF	M 6. 3V
C219	24436471	Cap, Ceramic	470PF	J 50V
C220	24793221	Cap, Electrolytic	220MF	M 10V
C221	24206228	Cap, Electrolytic	0. 22MF	M 50V
C222	24201220	Cap, Electrolytic	22MF	M 6. 3V
C223	24205479	Cap, Electrolytic	4. 7MF	M 35V
C224	24205479	Cap, Electrolytic	4. 7MF	M 35V
C232	24474103	Cap, Ceramic	0. 01MF	N 50V
C281	24632470	Cap, Electrolytic	47MF	M 10V
C301	24436181	Cap, Ceramic	180PF	J 50V
C303	24202101	Cap, Electrolytic	100MF	M 10V
C401	24436181	Cap, Ceramic	180PF	J 50V
C402	24436471	Cap, Ceramic	470PF	J 50V
C403	24538334	Cap, Plastic	0. 33MF	J 50V
C404	24201470	Cap, Electrolytic	47MF	M 6. 3V
C405	24206010	Cap, Electrolytic	1MF	M 50V
C406	24636010	Cap, Electrolytic	1MF	M 50V
C407	24794470	Cap, Electrolytic	47MF	M 16V
C408	24206010	Cap, Electrolytic	1MF	M 50V

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
C409	24206010	Cap, Electrolytic	1MF	M 50V
C410	24206010	Cap, Electrolytic	1MF	M 50V
C411	24201470	Cap, Electrolytic	47MF	M 6.3V
C412	24474103	Cap, Ceramic	0.01MF	N 50V
C413	24473189	Cap, Ceramic	0.18PF	M 50V
C415	24474103	Cap, Ceramic	0.01MF	N 50V
C462	24206010	Cap, Electrolytic	1MF	M 50V
C463	24206010	Cap, Electrolytic	1MF	M 50V
C464	24474103	Cap, Ceramic	0.01MF	N 50V
C465	24474103	Cap, Ceramic	0.01MF	N 50V
C466	24201470	Cap, Electrolytic	47MF	M 6.3V
C467	24206478	Cap, Electrolytic	0.47MF	M 50V
C468	24202101	Cap, Electrolytic	100MF	M 10V
C469	24201470	Cap, Electrolytic	47MF	M 6.3V
C481	24474103	Cap, Ceramic	0.01MF	N 50V
C831	24206010	Cap, Electrolytic	1MF	M 50V
C832	24795330	Cap, Electrolytic	33MF	M 25V
		- RESISTORS -		
R071	24366103	Res, Carbon	10K	J 1/6W
R073	24366472	Res, Carbon	4.7K	J 1/6W
R074	24366103	Res, Carbon	10K	J 1/6W
R075	24366472	Res, Carbon	4.7K	J 1/6W
R081	24366681	Res, Carbon	680	J 1/6W
R082	24366681	Res, Carbon	680	J 1/6W
R083	24366103	Res, Carbon	10K	J 1/6W
R084	24366152	Res, Carbon	1.5K	J 1/6W
R085	24366103	Res, Carbon	10K	J 1/6W
R101	24366102	Res, Carbon	1K	J 1/6W
R102	24367472	Res, Carbon	4.7K	G 1/6W
R103	24367122	Res, Carbon	1.2K	G 1/6W
R104	24366151	Res, Carbon	150	J 1/6W
R105	24367122	Res, Carbon	1.2K	G 1/6W
R106	24366271	Res, Carbon	270	J 1/6W
R107	24366391	Res, Carbon	390	J 1/6W
R108	24366152	Res, Carbon	1.5K	J 1/6W
R109	24366101	Res, Carbon	100	J 1/6W
R110	24366472	Res, Carbon	4.7K	J 1/6W
R201	24366102	Res, Carbon	1K	J 1/6W
R202	24366821	Res, Carbon	820	J 1/6W
R203	24000952	Res, Thermistor	3K	
R204	24366151	Res, Carbon	150	J 1/6W
R205	24366272	Res, Carbon	2.7K	J 1/6W
R206	24366391	Res, Carbon	390	J 1/6W
R207	24366183	Res, Carbon	18K	J 1/6W
R208	24366183	Res, Carbon	18K	J 1/6W
R209	24367102	Res, Carbon	1K	G 1/6W
R210	24367122	Res, Carbon	1.2K	G 1/6W
R211	24366122	Res, Carbon	1.2K	J 1/6W
R213	24366122	Res, Carbon	1.2K	J 1/6W
R214	24366472	Res, Carbon	4.7K	J 1/6W
R215	24366513	Res, Carbon	51K	J 1/6W
R216	24366102	Res, Carbon	1K	J 1/6W
R217	24366392	Res, Carbon	3.9K	J 1/6W
R219	24366182	Res, Carbon	1.8K	J 1/6W
R257	24066955	Res, Variable	1K	
R259	24066953	Res, Variable	100K	
R281	24366471	Res, Carbon	470	J 1/6W
R301	24366101	Res, Carbon	100	J 1/6W
R302	24366561	Res, Carbon	560	J 1/6W
R303	24366391	Res, Carbon	390	J 1/6W
R304	24367331	Res, Carbon	330	G 1/6W
R305	24367331	Res, Carbon	330	G 1/6W
R306	24366222	Res, Carbon	2.2K	J 1/6W
R307	24366102	Res, Carbon	1K	J 1/6W
R402	24366821	Res, Carbon	820	J 1/6W
R403	24366182	Res, Carbon	1.8K	J 1/6W
R404	24366271	Res, Carbon	270	J 1/6W
R405	24366333	Res, Carbon	33K	J 1/6W
R406	24366123	Res, Carbon	12K	J 1/6W
R407	24366101	Res, Carbon	100	J 1/6W
R408	24366271	Res, Carbon	270	J 1/6W
R409	24366391	Res, Carbon	390	J 1/6W
R410	24366821	Res, Carbon	820	J 1/6W
R411	24366152	Res, Carbon	1.5K	J 1/6W
R412	24366182	Res, Carbon	1.8K	J 1/6W
R413	24366122	Res, Carbon	1.2K	J 1/6W
R414	24366102	Res, Carbon	1K	J 1/6W
R415	24366102	Res, Carbon	1K	J 1/6W
R416	24366682	Res, Carbon	6.8K	J 1/6W
R417	24366112	Res, Carbon	1.1K	J 1/6W
R418	24366272	Res, Carbon	2.7K	J 1/6W
R419	24366273	Res, Carbon	27K	J 1/6W
R420	24366183	Res, Carbon	18K	J 1/6W
R422	24366392	Res, Carbon	3.9K	J 1/6W
R423	24366682	Res, Carbon	6.8K	J 1/6W
R463	24366821	Res, Carbon	820	J 1/6W
R464	24366223	Res, Carbon	22K	J 1/6W
R465	24366223	Res, Carbon	22K	J 1/6W
R466	24366105	Res, Carbon	1M	J 1/6W
R467	24366472	Res, Carbon	4.7K	J 1/6W
R468	24366684	Res, Carbon	680K	J 1/6W
R469	24366822	Res, Carbon	8.2K	J 1/6W
R470	24366302	Res, Carbon	3K	J 1/6W
R472	24366221	Res, Carbon	220	J 1/6W
R473	24366684	Res, Carbon	680K	J 1/6W
R474	24366103	Res, Carbon	10K	J 1/6W
R475	24366332	Res, Carbon	3.3K	J 1/6W
R476	24366271	Res, Carbon	270	J 1/6W
R481	24366101	Res, Carbon	100	J 1/6W
R482	24366303	Res, Carbon	30K	J 1/6W
R483	24366103	Res, Carbon	10K	J 1/6W
R484	24366681	Res, Carbon	680	J 1/6W
R485	24366302	Res, Carbon	3K	J 1/6W
R486	24366182	Res, Carbon	1.8K	J 1/6W
R487	24366392	Res, Carbon	3.9K	J 1/6W
R488	24366104	Res, Carbon	100K	J 1/6W
R489	24366223	Res, Carbon	22K	J 1/6W
R558	24066604	Res, Variable	200K	
R731	24366563	Res, Carbon	56K	J 1/6W
R732	24366182	Res, Carbon	1.8K	J 1/6W
R733	24366331	Res, Carbon	330	J 1/6W
R735	24366103	Res, Carbon	10K	J 1/6W
R751	24066952	Res, Variable	10K	
R752	24066948	Res, Variable	200K	
		- MISCELLANEOUS -		
P203A	23367203	Plug, 12P		
P703A	23367202	Plug, 11P		
Q831B	70391355	Screw, 3x8mm		
X401	70138060	Delay Line, 2H Delay		
Z090	70137187	F.U. VIF	FD-01	
Z202	23107631	Filter, 3.2MHz, TLC1126N		
Z402	23107645	Filter, 4.43MHz, TLC1108		
Z403	23107794	Filter, TLC1041, 4.16MHz		
Z481	70137214	F.U. SECAM	HSC-103	
d [redacted]	U202	70188178	P C Board Assy, MAIN	
e	U202	70188178	P C Board Assy, MAIN	
		- INTEGRATED CIRCUIT -		
IC201	70128037	IC	MSM6965-3RS	
IC291	70128180	IC	BA7259AK	
IC461	70119858	IC	LA7311	
IC491	B0379295	IC	TA8632F	
IC831	23318768	IC	AN7809F	
Z201	70128199	IC, Hybrid	THB89YP	
Z401	70128048	IC, Hybrid	THB88CP	
		- TRANSISTORS -		
Q081	A6332440	Transistor	2SC2458-GR	
Q082	A6546320	Transistor	2SA1297GR	
Q083	A6546310	Transistor	2SA1297Y	
Q084	A6012010	Transistor	RN2201	
Q085	A6002020	Transistor	RN1202	
Q086	A6002060	Transistor	RN1206	
Q101	A6332430	Transistor	2SC2458-Y	
Q102	A6332430	Transistor	2SC2458-Y	
Q181	A6002040	Transistor	RN1204	
Q202	A6534430	Transistor	2SA1048-Y	
Q203	A6002040	Transistor	RN1204	
Q204	A6332430	Transistor	2SC2458-Y	
Q205	A6012030	Transistor	RN2203	
Q206	A6012020	Transistor	RN2202	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
Q207	A6002040	Transistor	RN1204	
Q210	A6002040	Transistor	RN1204	
Q211	A6012040	Transistor	RN2204	
Q281	A6325549	Transistor	2SC2236-Y	
Q301	A6534430	Transistor	2SA1048-Y	
Q302	A6332430	Transistor	2SC2458-Y	
Q403	A6332430	Transistor	2SC2458-Y	
Q404	A6534430	Transistor	2SA1048-Y	
Q405	A6534430	Transistor	2SA1048-Y	
Q406	A6534430	Transistor	2SA1048-Y	
Q407	A6534430	Transistor	2SA1048-Y	
Q409	A6002040	Transistor	RN1204	
Q481	A6332430	Transistor	2SC2458-Y	
Q482	A6332430	Transistor	2SC2458-Y	
Q483	A6002040	Transistor	RN1204	
Q731	A6002030	Transistor	RN1203	
		- DIODES -		
D082	A7160570	Diode	1SS176	
D203	A7160570	Diode	1SS176	
D204	A7160570	Diode	1SS176	
D461	A7151450	Diode	1SS200	
D481	A7160570	Diode	1SS176	
		- COILS -		
L101	23237975	Coil, Peaking	TRF4101AC	
L102	23237980	Coil, Peaking	TRF4390AC	
L103	23237971	Coil, Peaking	TRF4221AC	
L104	23237985	Coil, Peaking	TRF4150AC	
L105	23237980	Coil, Peaking	TRF4390AC	
L201	23238910	Coil, Peaking	TRF4101AC	
L202	23238910	Coil, Peaking	TRF4101AC	
L204	23238914	Coil, Peaking	TRF4470AC	
L205	23238913	Coil, Peaking	TRF4560AC	
L206	23237980	Coil, Peaking	TRF4390AC	
L207	23237977	Coil, Peaking	TRF4680AC	
L208	23238916	Coil, Peaking	TRF4330AC	
L401	23237985	Coil, Peaking	TRF4150AC	
L402	23237977	Coil, Peaking	TRF4680AC	
L403	23237971	Coil, Peaking	TRF4221AC	
L404	23237817	Coil, Peaking	TRF4681AC	
L405	23237967	Coil, Peaking	TRF4471AC	
L406	23237989	Coil, Peaking	TRF4689AC	
L407	23237984	Coil, Peaking	TRF4180AC	
		- CAPACITORS -		
C071	24203220	Cap, Electrolytic	22MF	M 16V
C072	24474103	Cap, Ceramic	0. 01MF	N 50V
C073	24203101	Cap, Electrolytic	100MF	M 16V
C074	24474103	Cap, Ceramic	0. 01MF	N 50V
C075	24203220	Cap, Electrolytic	22MF	M 16V
C076	24474103	Cap, Ceramic	0. 01MF	N 50V
C079	24797470	Cap, Electrolytic	47MF	M 50V
C081	24203100	Cap, Electrolytic	10MF	M 16V
C082	24203100	Cap, Electrolytic	10MF	M 16V
C084	24203220	Cap, Electrolytic	22MF	M 16V
C101	24474103	Cap, Ceramic	0. 01MF	N 50V
C102	24201470	Cap, Electrolytic	47MF	M 6.3V
C103	24436181	Cap, Ceramic	180PF	J 50V
C104	24473399	Cap, Ceramic	3.9PF	K 50V
C105	24473689	Cap, Ceramic	6.8PF	K 50V
C106	24473150	Cap, Ceramic	15PF	J 50V
C107	24436331	Cap, Ceramic	330PF	J 50V
C108	24473560	Cap, Ceramic	56PF	J 50V
C109	24851333	Cap, Ceramic	0. 033MF	K 25V
C110	24474103	Cap, Ceramic	0. 01MF	N 50V
C111	24474103	Cap, Ceramic	0. 01MF	N 50V
C112	24436221	Cap, Ceramic	220PF	J 50V
C181	24436681	Cap, Ceramic	680PF	J 50V
C201	24474103	Cap, Ceramic	0. 01MF	N 50V
C202	24474103	Cap, Ceramic	0. 01MF	N 50V
C203	24205479	Cap, Electrolytic	4. 7MF	M 35V
C204	24474103	Cap, Ceramic	0. 01MF	N 50V
C205	24794470	Cap, Electrolytic	47MF	M 16V
C206	24474103	Cap, Ceramic	0. 01MF	N 50V
C207	24201470	Cap, Electrolytic	47MF	M 6.3V
C208	24473470	Cap, Ceramic	47PF	J 50V
C209	24436101	Cap, Ceramic	100PF	J 50V

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
C210	24473560	Cap, Ceramic	56PF	J 50V
C211	24473399	Cap, Ceramic	3.9PF	K 50V
C212	24201220	Cap, Electrolytic	22MF	M 6.3V
C213	24201220	Cap, Electrolytic	22MF	M 6.3V
C214	24473680	Cap, Ceramic	68PF	J 50V
C215	24201220	Cap, Electrolytic	22MF	M 6.3V
C216	24085973	Cap, Electrolytic	0.47MF	M 50V
C217	24206339	Cap, Electrolytic	3. 3MF	M 50V
C218	24201470	Cap, Electrolytic	47MF	M 6.3V
C219	24436471	Cap, Ceramic	470PF	J 50V
C220	24793221	Cap, Electrolytic	220MF	M 10V
C221	24206228	Cap, Electrolytic	0. 22MF	M 50V
C222	24201220	Cap, Electrolytic	22MF	M 6.3V
C223	24205479	Cap, Electrolytic	4. 7MF	M 35V
C224	24205479	Cap, Electrolytic	4. 7MF	M 35V
C232	24474103	Cap, Ceramic	0. 01MF	N 50V
C281	24632470	Cap, Electrolytic	47MF	M 10V
C301	24436181	Cap, Ceramic	180PF	J 50V
C302	24473680	Cap, Ceramic	68PF	J 50V
C303	24202101	Cap, Electrolytic	100MF	M 10V
C401	24436181	Cap, Ceramic	180PF	J 50V
C402	24436471	Cap, Ceramic	470PF	J 50V
C403	24538334	Cap, Plastic	0. 33MF	J 50V
C404	24201470	Cap, Electrolytic	47MF	M 6.3V
C405	24206010	Cap, Electrolytic	1MF	M 50V
C406	24636010	Cap, Electrolytic	1MF	M 50V
C407	24794470	Cap, Electrolytic	47MF	M 16V
C408	24206010	Cap, Electrolytic	1MF	M 50V
C409	24206010	Cap, Electrolytic	1MF	M 50V
C410	24206010	Cap, Electrolytic	1MF	M 50V
C411	24201470	Cap, Electrolytic	47MF	M 6.3V
C412	24474103	Cap, Ceramic	0. 01MF	N 50V
C413	24473189	Cap, Ceramic	0.18PF	M 50V
C415	24474103	Cap, Ceramic	0. 01MF	N 50V
C462	24206010	Cap, Electrolytic	1MF	M 50V
C463	24206010	Cap, Electrolytic	1MF	M 50V
C464	24474103	Cap, Ceramic	0. 01MF	N 50V
C465	24474103	Cap, Ceramic	0. 01MF	N 50V
C466	24201470	Cap, Electrolytic	47MF	M 6.3V
C467	24206478	Cap, Electrolytic	0. 47MF	M 50V
C468	24202101	Cap, Electrolytic	100MF	M 10V
C469	24201470	Cap, Electrolytic	47MF	M 6.3V
C481	24474103	Cap, Ceramic	0. 01MF	N 50V
C831	24206010	Cap, Electrolytic	1MF	M 50V
C832	24795330	Cap, Electrolytic	33MF	M 25V
		- RESISTORS -		
R071	24366103	Res, Carbon	10K	J 1/6W
R073	24366472	Res, Carbon	4. 7K	J 1/6W
R074	24366103	Res, Carbon	10K	J 1/6W
R075	24366472	Res, Carbon	4. 7K	J 1/6W
R081	24366681	Res, Carbon	680	J 1/6W
R082	24366681	Res, Carbon	680	J 1/6W
R083	24366103	Res, Carbon	10K	J 1/6W
R084	24366152	Res, Carbon	1. 5K	J 1/6W
R085	24366103	Res, Carbon	10K	J 1/6W
R101	24366102	Res, Carbon	1K	J 1/6W
R102	24367472	Res, Carbon	4. 7K	G 1/6W
R103	24367122	Res, Carbon	1. 2K	G 1/6W
R104	24366151	Res, Carbon	150	J 1/6W
R105	24367122	Res, Carbon	1. 2K	G 1/6W
R106	24366271	Res, Carbon	270	J 1/6W
R107	24366391	Res, Carbon	390	J 1/6W
R108	24366152	Res, Carbon	1. 5K	J 1/6W
R109	24366101	Res, Carbon	100	J 1/6W
R110	24366472	Res, Carbon	4. 7K	J 1/6W
R201	24366102	Res, Carbon	1K	J 1/6W
R202	24366821	Res, Carbon	820	J 1/6W
R203	24000952	Res, Thermistor	3K	
R204	24366151	Res, Carbon	150	J 1/6W
R205	24366272	Res, Carbon	2. 7K	J 1/6W
R206	24366391	Res, Carbon	390	J 1/6W
R207	24366183	Res, Carbon	18K	J 1/6W
R208	24366183	Res, Carbon	18K	J 1/6W
R209	24367102	Res, Carbon	1K	G 1/6W
R210	24367122	Res, Carbon	1. 2K	G 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
R211	24366122	Res, Carbon	1. 2K	J 1/6W
R213	24366122	Res, Carbon	1. 2K	J 1/6W
R214	24366472	Res, Carbon	4. 7K	J 1/6W
R215	24366513	Res, Carbon	51K	J 1/6W
R216	24366102	Res, Carbon	1K	J 1/6W
R217	24366392	Res, Carbon	3. 9K	J 1/6W
R219	24366182	Res, Carbon	1. 8K	J 1/6W
R257	24066955	Res, Variable	1K	
R259	24066953	Res, Variable	100K	
R281	24366471	Res, Carbon	470	J 1/6W
R301	24366101	Res, Carbon	100	J 1/6W
R302	24366561	Res, Carbon	560	J 1/6W
R303	24366391	Res, Carbon	390	J 1/6W
R304	24367331	Res, Carbon	330	G 1/6W
R305	24367331	Res, Carbon	330	G 1/6W
R306	24366222	Res, Carbon	2. 2K	J 1/6W
R307	24366102	Res, Carbon	1K	J 1/6W
R402	24366821	Res, Carbon	820	J 1/6W
R403	24366182	Res, Carbon	1. 8K	J 1/6W
R404	24366271	Res, Carbon	270	J 1/6W
R405	24366333	Res, Carbon	33K	J 1/6W
R406	24366123	Res, Carbon	12K	J 1/6W
R407	24366101	Res, Carbon	100	J 1/6W
R408	24366271	Res, Carbon	270	J 1/6W
R409	24366391	Res, Carbon	390	J 1/6W
R410	24366821	Res, Carbon	820	J 1/6W
R411	24366152	Res, Carbon	1. 5K	J 1/6W
R412	24366182	Res, Carbon	1. 8K	J 1/6W
R413	24366122	Res, Carbon	1. 2K	J 1/6W
R414	24366102	Res, Carbon	1K	J 1/6W
R415	24366102	Res, Carbon	1K	J 1/6W
R416	24366682	Res, Carbon	6. 8K	J 1/6W
R417	24366112	Res, Carbon	1. 1K	J 1/6W
R418	24366272	Res, Carbon	2. 7K	J 1/6W
R419	24366273	Res, Carbon	27K	J 1/6W
R420	24366183	Res, Carbon	18K	J 1/6W
R422	24366392	Res, Carbon	3. 9K	J 1/6W
R423	24366682	Res, Carbon	6. 8K	J 1/6W
R463	24366821	Res, Carbon	820	J 1/6W
R464	24366223	Res, Carbon	22K	J 1/6W
R465	24366223	Res, Carbon	22K	J 1/6W
R466	24366105	Res, Carbon	1M	J 1/6W
R467	24366472	Res, Carbon	4. 7K	J 1/6W
R468	24366684	Res, Carbon	680K	J 1/6W
R469	24366822	Res, Carbon	8. 2K	J 1/6W
R470	24366302	Res, Carbon	3K	J 1/6W
R472	24366221	Res, Carbon	220	J 1/6W
R473	24366684	Res, Carbon	680K	J 1/6W
R474	24366103	Res, Carbon	10K	J 1/6W
R475	24366332	Res, Carbon	3. 3K	J 1/6W
R476	24366271	Res, Carbon	270	J 1/6W
R481	24366101	Res, Carbon	100	J 1/6W
R482	24366303	Res, Carbon	30K	J 1/6W
R483	24366103	Res, Carbon	10K	J 1/6W
R484	24366681	Res, Carbon	680	J 1/6W
R485	24366302	Res, Carbon	3K	J 1/6W
R486	24366182	Res, Carbon	1. 8K	J 1/6W
R487	24366392	Res, Carbon	3. 9K	J 1/6W
R488	24366104	Res, Carbon	100K	J 1/6W
R489	24366223	Res, Carbon	22K	J 1/6W
R558	24066604	Res, Variable	200K	
R731	24366563	Res, Carbon	56K	J 1/6W
R732	24366182	Res, Carbon	1. 8K	J 1/6W
R733	24366331	Res, Carbon	330	J 1/6W
R735	24366103	Res, Carbon	10K	J 1/6W
R751	24066952	Res, Variable	10K	
R752	24066948	Res, Variable	200K	
		- MISCELLANEOUS -		
P203A	23367203	Plug, 12P		
P703A	23367202	Plug, 11P		
Q831B	70391355	Screw, 3x8mm		
X401	70138060	Delay Line, 2H Delay		
Z090	70137187	F.U. VIF	FD-01	
Z202	23107631	Filter, 3.2MHz, TLC1126N		
Z402	23107645	Filter, 4.43MHz, TLC1108		

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
Z403	23107794	Filter, TLC1041, 4. 16MHz		
Z481	70137214	F.U. SECAM	HSC-103	
a ■ U203	70188277	P C Board Assy, CONNECT U		
b U203	70188304	P C Board Assy, CONNECT U		
c U203	70188270	P C Board Assy, CONNECT U		
d U203	70188179	P C Board Assy, CONNECT U		
e U203	70188179	P C Board Assy, CONNECT U		
f U203	70188270	P C Board Assy, CONNECT U		
		- MISCELLANEOUS -		
P604B	23901586	Socket, 20P		
W251	70179895	Wire		
W252	70179896	Wire		
c W253	70179897	Wire		
d W253	70179897	Wire		
e W253	70179897	Wire		
f W253	70179897	Wire		
a ■ U801	70188278	P C Board Assy, POWER 1		
b U801	70188305	P C Board Assy, POWER 1		
c U801	70188271	P C Board Assy, POWER 1		
d U801	70188180	P C Board Assy, POWER 1		
e U801	70188180	P C Board Assy, POWER 1		
f U801	70188271	P C Board Assy, POWER 1		
		- INTEGRATED CIRCUIT -		
IC811	70135101	IC, Hybrid	STK7253	
		- TRANSISTORS -		
Q801	23314162	Transistor	2SD1379	
Q812	A6867970	Transistor	2SD1405-BL	
Q813	A6325549	Transistor	2SC2236-Y	
		- DIODES -		
⚠D801	23118485	Diode	ERC04-02F	
⚠D802	23118485	Diode	ERC04-02F	
⚠D803	23118485	Diode	ERC04-02F	
⚠D804	23118485	Diode	ERC04-02F	
D805	70115421	Diode, Zener	EQA02-05E	
⚠D806	23118486	Diode	ERA15-02	
⚠D807	23118486	Diode	ERA15-02	
⚠D808	23118486	Diode	ERA15-02	
⚠D809	23118486	Diode	ERA15-02	
D811	A7160570	Diode	1SS176	
D812	A7117015	Diode, Zener	04AZ10Y	
		- COILS -		
L811	23103961	Coil, Choke	2BF253D-01	
L812	23103961	Coil, Choke	2BF253D-01	
L813	23103961	Coil, Choke	2BF253D-01	
L814	23221817	Coil	L201-12	
		- CAPACITORS -		
⚠C801	24094916	Cap, Ceramic	0.0047MF	400V
⚠C803	24232223	Cap, Ceramic	0. 022MF	Z 50V
C804	24232223	Cap, Ceramic	0. 022MF	Z 50V
⚠C805	24630728	Cap, Electrolytic	4000MF	M 25V
C806	24232223	Cap, Ceramic	0. 022MF	Z 50V
C807	24232223	Cap, Ceramic	0. 022MF	Z 50V
⚠C808	24795102	Cap, Electrolytic	1000MF	M 25V
C811	24795101	Cap, Electrolytic	100MF	M 25V
C813	24794222	Cap, Electrolytic	2200F	M 16V
C814	24794470	Cap, Electrolytic	47MF	M 16V
C815	24206010	Cap, Electrolytic	1MF	M 50V
C816	24203220	Cap, Electrolytic	22MF	M 16V
C817	24793101	Cap, Electrolytic	100MF	M 10V
C818	24203220	Cap, Electrolytic	22MF	M 16V
C819	24203470	Cap, Electrolytic	47MF	M 16V
		- RESISTORS -		
⚠R801	24000300	Res, Fusible	2.7	J 1/4W
R802	24366823	Res, Carbon	82K	J 1/6W
R803	24366472	Res, Carbon	4. 7K	J 1/6W
R811	24366301	Res, Carbon	300	J 1/6W
R812	24366153	Res, Carbon	15K	J 1/6W
R813	24366331	Res, Carbon	330	J 1/6W
		- MISCELLANEOUS -		
⚠F801A	23165102	Fuse Holder		
⚠F802A	23165102	Fuse Holder		
Q811C	72471081	Screw, 3x8mm		
⚠Z811	23144836	Fuse, 125V, 1.6A		

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
⚠Z812	23144836	Fuse, 125V, 1.6A		
a ■U802	70188279	P C Board Assy, POWER TR		
b U802	70188306	P C Board Assy, POWER TR		
c U802	70188272	P C Board Assy, POWER TR		
d U802	70188181	P C Board Assy, POWER TR		
e U802	70188181	P C Board Assy, POWER TR		
f U802	70188272	P C Board Assy, POWER TR		
		- INTEGRATED CIRCUIT -		
IC821	23318769	IC	AN7812F	
		- CAPACITORS -		
C809	24206010	Cap, Electrolytic	1MF	M 50V
C810	24204330	Cap, Electrolytic	33MF	M 25V
		- MISCELLANEOUS -		
W809	70179928	Wire		
a ■UL01	70188280	P C Board Assy, LOGIC SW		
b UL01	70188307	P C Board Assy, LOGIC SW		
c UL01	70188273	P C Board Assy, LOGIC SW		
d UL01	70188182	P C Board Assy, LOGIC SW		
e UL01	70188182	P C Board Assy, LOGIC SW		
f UL01	70188273	P C Board Assy, LOGIC SW		
		- TRANSISTORS -		
QX05	A6012020	Transistor	RN2202	
		- DIODES -		
DX34	A8606316	Diode, LED	TLG133A-FA	
DX35	A8606316	Diode, LED	TLG133A-FA	
		- RESISTORS -		
R258	24069658	Res, Variable	10K	
R556	24069653	Res, Variable	500K	
RX13	24366910	Res, Carbon	91	J 1/6W
		- MISCELLANEOUS -		
PX01B	23902605	Socket, 12P		
SL02	23344094	Push Switch		
SL03	23344094	Push Switch		
SL05	23344094	Push Switch		
SL06	23344094	Push Switch		
SL07	23344094	Push Switch		
SL08	23344094	Push Switch		
SL09	23344094	Push Switch		
SX20	23344094	Push Switch		
a ■U601	70188274	P C Board Assy, SUBMAIN		
b U601	70188274	P C Board Assy, SUBMAIN		
c U601	70188265	P C Board Assy, SUBMAIN		
d U601	70188167	P C Board Assy, SUBMAIN		
e U601	70188167	P C Board Assy, SUBMAIN		
f U601	70188265	P C Board Assy, SUBMAIN		
		- INTEGRATED CIRCUIT -		
IC501	70128264	IC	TD6372N-E2	
IC502	70119738	IC	LM2902N	
IC503	B0349250	IC	TA75393S	
IC504	70119738	IC	LM2902N	
IC601	70128261	IC	TMP47C860N-2	
IC603	B0320660	IC	TA7291P	
IC604	B0349260	IC	TA75393P	
IC605	70119743	IC	PST523D	
c ICE81	70128262	IC	TMP47C800N-2	
d ICE81	70128262	IC	TMP47C800N-2	
		- TRANSISTORS -		
Q506	A6002040	Transistor	RN1204	
Q507	A6012040	Transistor	RN2204	
Q508	A6002040	Transistor	RN1204	
Q512	A6868350	Transistor	2SD1413	
Q513	A6868350	Transistor	2SD1413	
Q514	A6332430	Transistor	2SC2458-Y	
Q614	A6325549	Transistor	2SC2236-Y	
Q615	A6534430	Transistor	2SA1048-Y	
Q616	A6533247	Transistor	2SA966-Y	
Q617	A6325549	Transistor	2SC2236-Y	
Q629	A6002020	Transistor	RN1202	
Q630	A6002040	Transistor	RN1204	
Q633	A6002040	Transistor	RN1204	
Q634	A6012060	Transistor	RN2206	
Q637	A6012060	Transistor	RN2206	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
		- DIODES -		
D081	A7118215	Diode, Zener	04AZ33Y	
D501	23316270	Diode	DA218S	
D503	23316270	Diode	DA218S	
D504	A7160570	Diode	1SS176	
D505	23316270	Diode	DA218S	
D506	23316270	Diode	DA218S	
D507	A7160570	Diode	1SS176	
D508	A7160570	Diode	1SS176	
D509	23316270	Diode	DA218S	
D510	A7151500	Diode	1SS201	
D514	A7117325	Diode, Zener	04AZ13Z	
D515	A7160570	Diode	1SS176	
D516	A7160570	Diode	1SS176	
D603	A7160570	Diode	1SS176	
D609	A7160570	Diode	1SS176	
DX60	A7160570	Diode	1SS176	
		- COILS -		
L841	23238653	Coil, Peaking	TRF4470AI	
		- CAPACITORS -		
C085	24797470	Cap, Electrolytic	47MF	M 50V
C501	24795101	Cap, Electrolytic	100MF	M 25V
C502	24206010	Cap, Electrolytic	1MF	M 50V
C503	24474102	Cap, Ceramic	1000PF	K 50V
C504	24538473	Cap, Plastic	0.047MF	J 50V
C505	24794470	Cap, Electrolytic	47MF	M 16V
C506	24474103	Cap, Ceramic	0.01MF	N 50V
C507	24085987	Cap, Electrolytic	4.7MF	M 16V
C508	24206229	Cap, Electrolytic	2.2MF	M 50V
C509	24474102	Cap, Ceramic	1000PF	K 50V
C510	24474332	Cap, Ceramic	3300PF	N 16V
C511	24474103	Cap, Ceramic	0.01MF	N 50V
C512	24473470	Cap, Ceramic	47PF	J 50V
C513	24474561	Cap, Ceramic	560PF	K 50V
C514	24538823	Cap, Plastic	0.082MF	J 50V
C515	24538183	Cap, Plastic	0.018MF	J 50V
C516	24206229	Cap, Electrolytic	2.2MF	M 50V
C517	24591272	Cap, Plastic	2700PF	J 50V
C518	24474103	Cap, Ceramic	0.01MF	N 50V
C520	24794470	Cap, Electrolytic	47MF	M 16V
C521	24203470	Cap, Electrolytic	47MF	M 16V
C522	24474103	Cap, Ceramic	0.01MF	N 50V
C524	24538224	Cap, Plastic	0.22MF	J 50V
C525	24474102	Cap, Ceramic	1000PF	K 50V
C526	24474102	Cap, Ceramic	1000PF	K 50V
C527	24538124	Cap, Plastic	0.12MF	J 50V
C528	24474103	Cap, Ceramic	0.01MF	N 50V
C529	24203100	Cap, Electrolytic	10MF	M 16V
C530	24474222	Cap, Ceramic	2200PF	N 16V
C531	24474222	Cap, Ceramic	2200PF	N 16V
C532	24474332	Cap, Ceramic	3300PF	N 16V
C533	24206229	Cap, Electrolytic	2.2MF	M 50V
C534	24794470	Cap, Electrolytic	47MF	M 16V
C535	24203220	Cap, Electrolytic	22MF	M 16V
C536	24474101	Cap, Ceramic	100PF	K 50V
C537	24474103	Cap, Ceramic	0.01MF	N 50V
C538	24474331	Cap, Ceramic	330PF	K 50V
C540	24474103	Cap, Ceramic	0.01MF	N 50V
C543	24591243	Cap, Plastic	0.024MF	J 50V
C544	24474103	Cap, Ceramic	0.01MF	N 50V
C545	24474103	Cap, Ceramic	0.01MF	N 50V
C546	24474103	Cap, Ceramic	0.01MF	N 50V
C547	24206478	Cap, Electrolytic	0.47MF	M 50V
C548	24203220	Cap, Electrolytic	22MF	M 16V
C556	24591102	Cap, Plastic	1000PF	J 50V
C557	24538223	Cap, Plastic	0.022MF	J 50V
C561	24206229	Cap, Electrolytic	2.2MF	M 50V
C601	24201470	Cap, Electrolytic	47MF	M 6.3V
C602	24206010	Cap, Electrolytic	1MF	M 50V
C604	24473330	Cap, Ceramic	33PF	J 50V
C605	24473330	Cap, Ceramic	33PF	J 50V
C609	24794101	Cap, Electrolytic	100MF	M 16V
C613	24538104	Cap, Plastic	0.1MF	J 50V
C620	24232223	Cap, Ceramic	0.022MF	Z 50V
C623	24474103	Cap, Ceramic	0.01MF	N 50V

	LOCATION NUMBER	PART NUMBER	DESCRIPTION		
	C624	24794470	Cap, Electrolytic	47MF	M 16V
	C625	24474471	Cap, Ceramic	470PF	K 50V
	C626	24792331	Cap, Electrolytic	330MF	M 6.3V
	C627	24794470	Cap, Electrolytic	47MF	M 16V
	C628	24474471	Cap, Ceramic	470PF	K 50V
	C640	24474103	Cap, Ceramic	0.01MF	N 50V
	C841	24793101	Cap, Electrolytic	100MF	M 10V
c	CE83	24473330	Cap, Ceramic	33PF	J 50V
d	CE83	24473330	Cap, Ceramic	33PF	J 50V
c	CE84	24473330	Cap, Ceramic	33PF	J 50V
d	CE84	24473330	Cap, Ceramic	33PF	J 50V
c	CE85	24232223	Cap, Ceramic	0.022MF	Z 50V
d	CE85	24232223	Cap, Ceramic	0.022MF	Z 50V
	CX60	24090979	Cap, Super	0.047F	Z 5.5V
	CX61	24792471	Cap, Electrolytic	470MF	M 6.3V
			- RESISTORS -		
	R091	24366202	Res, Carbon	2K	J 1/6W
	R092	24366202	Res, Carbon	2K	J 1/6W
	R501	24552620	Res, Oxide Metal	62	J 1/2W
	R502	24366182	Res, Carbon	1.8K	J 1/6W
	R503	24366563	Res, Carbon	56K	J 1/6W
	R504	24366152	Res, Carbon	1.5K	J 1/6W
	R505	24366122	Res, Carbon	1.2K	J 1/6W
	R506	24366331	Res, Carbon	330	J 1/6W
	R507	24366105	Res, Carbon	1M	J 1/6W
	R508	24366754	Res, Carbon	750K	J 1/6W
	R509	24366105	Res, Carbon	1M	J 1/6W
	R510	24366182	Res, Carbon	1.8K	J 1/6W
	R511	24366472	Res, Carbon	4.7K	J 1/6W
	R512	24366104	Res, Carbon	100K	J 1/6W
	R513	24366753	Res, Carbon	75K	J 1/6W
	R514	24366203	Res, Carbon	20K	J 1/6W
	R515	24366124	Res, Carbon	120K	J 1/6W
	R516	24366474	Res, Carbon	470K	J 1/6W
	R518	24366472	Res, Carbon	4.7K	J 1/6W
	R519	24366472	Res, Carbon	4.7K	J 1/6W
	R520	24366102	Res, Carbon	1K	J 1/6W
	R521	24366123	Res, Carbon	12K	J 1/6W
	R522	24366103	Res, Carbon	10K	J 1/6W
	R523	24366103	Res, Carbon	10K	J 1/6W
	R524	24366473	Res, Carbon	47K	J 1/6W
	R525	24366223	Res, Carbon	22K	J 1/6W
	R526	24366222	Res, Carbon	2.2K	J 1/6W
	R527	24366183	Res, Carbon	18K	J 1/6W
	R528	24366182	Res, Carbon	1.8K	J 1/6W
	R529	24366221	Res, Carbon	220	J 1/6W
	R530	24366362	Res, Carbon	3.6K	J 1/6W
	R531	24366182	Res, Carbon	1.8K	J 1/6W
	R533	24366102	Res, Carbon	1K	J 1/6W
	R534	24366154	Res, Carbon	150K	J 1/6W
	R535	24366124	Res, Carbon	120K	J 1/6W
	R537	24366622	Res, Carbon	6.2K	J 1/6W
	R538	24366562	Res, Carbon	5.6K	J 1/6W
	R539	24366562	Res, Carbon	5.6K	J 1/6W
	R540	24366683	Res, Carbon	68K	J 1/6W
	R541	24366683	Res, Carbon	68K	J 1/6W
	R542	24366104	Res, Carbon	100K	J 1/6W
	R544	24366752	Res, Carbon	7.5K	J 1/6W
	R545	24366683	Res, Carbon	68K	J 1/6W
	R546	24366472	Res, Carbon	4.7K	J 1/6W
	R547	24366103	Res, Carbon	10K	J 1/6W
	R548	24366103	Res, Carbon	10K	J 1/6W
	R549	24366105	Res, Carbon	1M	J 1/6W
	R551	24066617	Res, Variable, Metal	200K	
	R553	24066935	Res, Variable	200K	
	R560	24366182	Res, Carbon	1.8K	J 1/6W
	R561	24366102	Res, Carbon	1K	J 1/6W
	R562	24366333	Res, Carbon	33K	J 1/6W
	R563	24366684	Res, Carbon	680K	J 1/6W
	R564	24366473	Res, Carbon	47K	J 1/6W
	R565	24366473	Res, Carbon	47K	J 1/6W
	R566	24941275	Res, Composition	2.7M	J 1/4W
	R567	24366392	Res, Carbon	3.9K	J 1/6W
	R568	24366272	Res, Carbon	2.7K	J 1/6W
	R569	24366163	Res, Carbon	16K	J 1/6W

	LOCATION NUMBER	PART NUMBER	DESCRIPTION		
	R570	24366392	Res, Carbon	3.9K	J 1/6W
	R571	24366822	Res, Carbon	8.2K	J 1/6W
	R572	24366822	Res, Carbon	8.2K	J 1/6W
	R573	24366392	Res, Carbon	3.9K	J 1/6W
	R574	24366392	Res, Carbon	3.9K	J 1/6W
	R575	24941275	Res, Composition	2.7M	J 1/4W
	R576	24366473	Res, Carbon	47K	J 1/6W
	R577	24366164	Res, Carbon	160K	J 1/6W
	R578	24366223	Res, Carbon	22K	J 1/6W
	R580	24366472	Res, Carbon	4.7K	J 1/6W
	R581	24366472	Res, Carbon	4.7K	J 1/6W
	R582	24366103	Res, Carbon	10K	J 1/6W
	R583	24366104	Res, Carbon	100K	J 1/6W
	R584	24366221	Res, Carbon	220	J 1/6W
	R585	24366623	Res, Carbon	62K	J 1/6W
	R587	24366681	Res, Carbon	680	J 1/6W
	R588	24366102	Res, Carbon	1K	J 1/6W
	R590	24366753	Res, Carbon	75K	J 1/6W
	R604	24366473	Res, Carbon	47K	J 1/6W
	R609	24366102	Res, Carbon	1K	J 1/6W
	R610	24366472	Res, Carbon	4.7K	J 1/6W
	R611	24366472	Res, Carbon	4.7K	J 1/6W
	R612	24366243	Res, Carbon	24K	J 1/6W
	R613	24366473	Res, Carbon	47K	J 1/6W
	R614	24366472	Res, Carbon	4.7K	J 1/6W
	R615	24366472	Res, Carbon	4.7K	J 1/6W
	R621	24366223	Res, Carbon	22K	J 1/6W
	R622	24366223	Res, Carbon	22K	J 1/6W
	R623	24366223	Res, Carbon	22K	J 1/6W
	R624	24366472	Res, Carbon	4.7K	J 1/6W
	R625	24366102	Res, Carbon	1K	J 1/6W
	R626	24366472	Res, Carbon	4.7K	J 1/6W
	R627	24366102	Res, Carbon	1K	J 1/6W
	R628	24366472	Res, Carbon	4.7K	J 1/6W
	R631	24366183	Res, Carbon	18K	J 1/6W
	R632	24366183	Res, Carbon	18K	J 1/6W
	R633	24366103	Res, Carbon	10K	J 1/6W
	R634	24366332	Res, Carbon	3.3K	J 1/6W
	R635	24366102	Res, Carbon	1K	J 1/6W
	R636	24366222	Res, Carbon	2.2K	J 1/6W
	R637	24366561	Res, Carbon	560	J 1/6W
	R640	24366473	Res, Carbon	47K	J 1/6W
	R643	24366302	Res, Carbon	3K	J 1/6W
	R667	24366332	Res, Carbon	3.3K	J 1/6W
	R668	24366682	Res, Carbon	6.8K	J 1/6W
	R669	24366472	Res, Carbon	4.7K	J 1/6W
	R670	24366103	Res, Carbon	10K	J 1/6W
	R672	24366102	Res, Carbon	1K	J 1/6W
	R673	24366102	Res, Carbon	1K	J 1/6W
	R674	24366102	Res, Carbon	1K	J 1/6W
	R675	24366223	Res, Carbon	22K	J 1/6W
	R676	24366101	Res, Carbon	100	J 1/6W
	R677	24366103	Res, Carbon	10K	J 1/6W
	R678	24366103	Res, Carbon	10K	J 1/6W
	R679	24366103	Res, Carbon	10K	J 1/6W
	R680	24366183	Res, Carbon	18K	J 1/6W
	R681	24366432	Res, Carbon	4.3K	J 1/6W
	R682	24366432	Res, Carbon	4.3K	J 1/6W
	R683	24366471	Res, Carbon	470	J 1/6W
	R684	24366272	Res, Carbon	2.7K	J 1/6W
	R685	24366203	Res, Carbon	20K	J 1/6W
	R686	24366134	Res, Carbon	130K	J 1/6W
	R687	24366822	Res, Carbon	8.2K	J 1/6W
	R688	24366914	Res, Carbon	910K	J 1/6W
	R689	24366304	Res, Carbon	300K	J 1/6W
	R691	24366102	Res, Carbon	1K	J 1/6W
	R692	24366102	Res, Carbon	1K	J 1/6W
	R693	24366102	Res, Carbon	1K	J 1/6W
	R694	24366222	Res, Carbon	2.2K	J 1/6W
	R695	24366223	Res, Carbon	22K	J 1/6W
	R697	24366103	Res, Carbon	10K	J 1/6W
	R698	24366103	Res, Carbon	10K	J 1/6W
	R699	24366472	Res, Carbon	4.7K	J 1/6W
c	RE80	24366223	Res, Carbon	22K	J 1/6W
d	RE80	24366223	Res, Carbon	22K	J 1/6W

	LOCATION NUMBER	PART NUMBER	DESCRIPTION		
c	RE83	24366102	Res, Carbon	1K	J 1/6W
d	RE83	24366102	Res, Carbon	1K	J 1/6W
c	RE85	24366102	Res, Carbon	1K	J 1/6W
d	RE85	24366102	Res, Carbon	1K	J 1/6W
c	RE86	24366102	Res, Carbon	1K	J 1/6W
d	RE86	24366102	Res, Carbon	1K	J 1/6W
c	RE87	24366102	Res, Carbon	1K	J 1/6W
d	RE87	24366102	Res, Carbon	1K	J 1/6W
c	RE88	24366102	Res, Carbon	1K	J 1/6W
d	RE88	24366102	Res, Carbon	1K	J 1/6W
d	RE89	24366102	Res, Carbon	1K	J 1/6W
d	RE90	24366472	Res, Carbon	4. 7K	J 1/6W
c	RE92	24366473	Res, Carbon	47K	J 1/6W
d	RE92	24366473	Res, Carbon	47K	J 1/6W
c	RE94	24366473	Res, Carbon	47K	J 1/6W
	RL11	24366102	Res, Carbon	1K	J 1/6W
	RL12	24366222	Res, Carbon	2. 2K	J 1/6W
	RL13	24366561	Res, Carbon	560	J 1/6W
	RX69	24366301	Res, Carbon	300	J 1/6W
	RX76	24366151	Res, Carbon	150	J 1/6W
	RX77	24366151	Res, Carbon	150	J 1/6W
			- MISCELLANEOUS -		
	P601	23901261	Socket, 18P		
	P603	23901260	Socket, 17P		
	P604A	23367182	Plug, 20P		
	Q513C	23721308	Screw, 3x8mm		
	X601	23153672	Resonator, TCR1035		
c	XE81	23153672	Resonator, TCR1035		
d	XE81	23153672	Resonator, TCR1035		
	⚠Z601	23118122	IC Protector, ICP-N5		
	⚠Z602	23118122	IC Protector, ICP-N5		
	Z801	23107550	DC-DC Converter, CTX006		
	Z802	23118132	IC Protector		
	■U701	70198968	P C Board Assy, AUDIO		
			- INTEGRATED CIRCUIT -		
	IC701	70119932	IC	BA7765AS	
			- TRANSISTORS -		
	Q702	A6319300	Transistor	2SC1959-Y	
			- COILS -		
	L701	23237729	Coil, Peaking	TRF4822AP	
	L702	23237969	Coil, Peaking	TRF4331AC	
			- CAPACITORS -		
	# C701	24436821	Cap, Ceramic	820PF	J 50V
	C702	24212332	Cap, Ceramic	3300PF	K 50V
	C703	24206479	Cap, Electrolytic	4. 7MF	M 50V
	# C704	24212101	Cap, Ceramic	100PF	K 50V
	C705	24591103	Cap, Plastic	0. 01MF	J 50V
	C706	24203100	Cap, Electrolytic	10MF	M 16V
	C707	24203100	Cap, Electrolytic	10MF	M 16V
	C708	24203470	Cap, Electrolytic	47MF	M 16V
	C709	24085988	Cap, Electrolytic	1MF	M 50V
	C713	24206479	Cap, Electrolytic	4. 7MF	M 50V
	C714	24591822	Cap, Plastic	8200PF	J 50V
	C715	24591183	Cap, Plastic	0. 018MF	J 50V
	C716	24591203	Cap, Plastic	0. 02MF	J 50V
	C717	24206010	Cap, Electrolytic	1MF	M 50V
	C718	24206010	Cap, Electrolytic	1MF	M 50V
	C719	24204330	Cap, Electrolytic	33MF	M 25V
	C720	24591103	Cap, Plastic	0. 01MF	J 50V
	C721	24591103	Cap, Plastic	0. 01MF	J 50V
	C722	24203470	Cap, Electrolytic	47MF	M 16V
	C723	24082049	Cap, Plastic	0.047MF	J 100V
	C724	24214221	Cap, Ceramic	220PF	K 500V
	C725	24232103	Cap, Ceramic	0. 01MF	Z 50V
			- RESISTORS -		
	# R701	24360473	Res, Carbon	47K	J 1/8W
	# R702	24360511	Res, Carbon	510	J 1/8W
	# R703	24360334	Res, Carbon	330K	J 1/8W
	# R704	24360221	Res, Carbon	220	J 1/8W
	# R705	24360123	Res, Carbon	12K	J 1/8W
	# R706	24360562	Res, Carbon	5. 6K	J 1/8W
	# R707	24360105	Res, Carbon	1M	J 1/8W
	# R708	24360272	Res, Carbon	2. 7K	J 1/8W
	# R709	24360103	Res, Carbon	10K	J 1/8W
	# R711	24360102	Res, Carbon	1K	J 1/8W
	# R712	24360102	Res, Carbon	1K	J 1/8W
	# R713	24360273	Res, Carbon	27K	J 1/8W
	# R714	24360472	Res, Carbon	4. 7K	J 1/8W
	# R715	24360392	Res, Carbon	3. 9K	J 1/8W
	# R716	24360100	Res, Carbon	10	J 1/8W
	# R717	24360201	Res, Carbon	200	J 1/8W
	# R718	24360562	Res, Carbon	5. 6K	J 1/8W
	# R719	24360333	Res, Carbon	33K	J 1/8W
	# R720	24360229	Res, Carbon	2. 2	J 1/8W
	# R721	24360101	Res, Carbon	100	J 1/8W
	# R722	24360822	Res, Carbon	8. 2K	J 1/8W
			- MISCELLANEOUS -		
	T701	23224916	Coil	TLN1069T	
	■UB01	70198420	P C Board Assy, PIF SECOND		
			- INTEGRATED CIRCUIT -		
	ICB01	B0357660	IC	TA7718P	
			- TRANSISTORS -		
	QB02	A6332430	Transistor	2SC2458-Y	
	QB03	A6332430	Transistor	2SC2458-Y	
	QB04	A6332430	Transistor	2SC2458-Y	
	QB05	A6332430	Transistor	2SC2458-Y	
	QB12	A6317440	Transistor	2SC1815-Y	
			- COILS -		
	LB01	23261986	Coil, Choke	TRF9220	
	LB02	23262835	Coil, PIF	TRF1058	
	LB03	23238912	Coil, Peaking	TRF4680AC	
	LB52	23262813	Coil, IF	TRF1077D	
			- CAPACITORS -		
	CB01	24474103	Cap, Ceramic	0. 01MF	N 50V
	CB02	24474103	Cap, Ceramic	0. 01MF	N 50V
	CB03	24203330	Cap, Electrolytic	33MF	M 16V
	CB04	24203220	Cap, Electrolytic	22MF	M 16V
	CB05	24203100	Cap, Electrolytic	10MF	M 16V
	CB06	24591102	Cap, Plastic	1000PF	J 50V
	CB09	24203101	Cap, Electrolytic	100MF	M 16V
	CB10	24474103	Cap, Ceramic	0. 01MF	N 50V
	CB11	24203100	Cap, Electrolytic	10MF	M 16V
	CB12	24203100	Cap, Electrolytic	10MF	M 16V
	CB13	24203100	Cap, Electrolytic	10MF	M 16V
	CB14	24203470	Cap, Electrolytic	47MF	M 16V
			- RESISTORS -		
	RB01	24366151	Res, Carbon	150	J 1/6W
	RB02	24366102	Res, Carbon	1K	J 1/6W
	RB03	24366102	Res, Carbon	1K	J 1/6W
	RB04	24366392	Res, Carbon	3. 9K	J 1/6W
	RB05	24366182	Res, Carbon	1. 8K	J 1/6W
	RB06	24366223	Res, Carbon	22K	J 1/6W
	RB07	24366622	Res, Carbon	6. 2K	J 1/6W
	RB08	24366623	Res, Carbon	62K	J 1/6W
	RB09	24366103	Res, Carbon	10K	J 1/6W
	RB10	24366102	Res, Carbon	1K	J 1/6W
	RB11	24366102	Res, Carbon	1K	J 1/6W
	RB12	24366681	Res, Carbon	680	J 1/6W
	RB13	24366102	Res, Carbon	1K	J 1/6W
	RB14	24366154	Res, Carbon	150K	J 1/6W
	RB15	24366681	Res, Carbon	680	J 1/6W
	RB22	24552151	Res, Oxide Metal	150	J 1/2W
			- MISCELLANEOUS -		
	PB01	23367434	Plug, 15P		
	ZB01	A5613023	Filter, F328BM		
b	■UB01	70188168	P C Board Assy, PIF SECOND		
d	UB01	70188168	P C Board Assy, PIF SECOND		
e	UB01	70188168	P C Board Assy, PIF SECOND		
			- INTEGRATED CIRCUIT -		
	ICB01	70128242	IC	TDA8192	
			- TRANSISTORS -		
	QB02	A6534430	Transistor	2SA1048-Y	
	QB03	A6332430	Transistor	2SC2458-Y	
	QB04	A6332430	Transistor	2SC2458-Y	
	QB05	A6332430	Transistor	2SC2458-Y	
	QB06	A6002020	Transistor	RN1202	
	QB07	A6317440	Transistor	2SC1815-Y	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
QB08	A6534430	Transistor	2SA1048-Y	
		- COILS -		
LB01	23238503	Coil, Peaking	TRF4129AJ	
LB02	23238559	Coil, Peaking	TRF4R56AJ	
LB03	23238713	Coil, Peaking	TRF4120AJ	
LB04	23238720	Coil, Peaking	TRF4339AJ	
LB05	23238710	Coil, Peaking	TRF4220AJ	
LB51	23262664	Coil, IF	TRF1158T	
LB52	23262813	Coil, IF	TRF1077D	
LB53	23262665	Coil, IF	TRF1159T	
		- CAPACITORS -		
CB01	24203101	Cap, Electrolytic	100MF	M 16V
# CB02	24232103	Cap, Ceramic	0. 01MF	Z 50V
CB03	24203100	Cap, Electrolytic	10MF	M 16V
CB04	24203330	Cap, Electrolytic	33MF	M 16V
CB05	24203220	Cap, Electrolytic	22MF	M 16V
# CB06	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CB07	24436470	Cap, Ceramic	47PF	J 50V
# CB08	24436470	Cap, Ceramic	47PF	J 50V
# CB09	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CB10	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CB11	24232103	Cap, Ceramic	0. 01MF	Z 50V
CB12	24591392	Cap, Plastic	3900PF	J 50V
# CB13	24232103	Cap, Ceramic	0. 01MF	Z 50V
CB14	24203101	Cap, Electrolytic	100MF	M 16V
# CB15	24212681	Cap, Ceramic	680PF	K 50V
CB16	24206478	Cap, Electrolytic	0. 47MF	M 50V
CB17	24206479	Cap, Electrolytic	4. 7MF	M 50V
CB18	24203470	Cap, Electrolytic	47MF	M 16V
# CB19	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CB20	24232103	Cap, Ceramic	0. 01MF	Z 50V
		- RESISTORS -		
# RB01	24360820	Res, Carbon	82	J 1/8W
# RB02	24360152	Res, Carbon	1. 5K	J 1/8W
# RB03	24360122	Res, Carbon	1. 2K	J 1/8W
# RB04	24360123	Res, Carbon	12K	J 1/8W
# RB05	24360153	Res, Carbon	15K	J 1/8W
# RB06	24360102	Res, Carbon	1K	J 1/8W
# RB07	24360103	Res, Carbon	10K	J 1/8W
# RB08	24360303	Res, Carbon	30K	J 1/8W
# RB09	24360473	Res, Carbon	47K	J 1/8W
# RB10	24360822	Res, Carbon	8. 2K	J 1/8W
# RB11	24360153	Res, Carbon	15K	J 1/8W
# RB12	24360102	Res, Carbon	1K	J 1/8W
# RB13	24360102	Res, Carbon	1K	J 1/8W
# RB14	24360273	Res, Carbon	27K	J 1/8W
# RB15	24360682	Res, Carbon	6. 8K	J 1/8W
# RB16	24360102	Res, Carbon	1K	J 1/8W
# RB17	24360681	Res, Carbon	680	J 1/8W
# RB18	24360821	Res, Carbon	820	J 1/8W
# RB19	24360822	Res, Carbon	8. 2K	J 1/8W
# RB20	24360823	Res, Carbon	82K	J 1/8W
# RB21	24360124	Res, Carbon	120K	J 1/8W
# RB22	24360301	Res, Carbon	300	J 1/8W
# RB23	24360301	Res, Carbon	300	J 1/8W
# RB24	24360102	Res, Carbon	1K	J 1/8W
# RB25	24360222	Res, Carbon	2. 2K	J 1/8W
# RB26	24360221	Res, Carbon	220	J 1/8W
		- MISCELLANEOUS -		
PB01	23367434	Plug, 15P		
ZB01	70155001	Filter, SIF, 39. 2MHz		
ZB02	23107947	Filter, SIF, 5. 5MHz		
a ■ UF01	70188267	P C Board Assy, TERMINAL 1		
b UF01	70188170	P C Board Assy, TERMINAL 1		
c UF01	70188267	P C Board Assy, TERMINAL 1		
d UF01	70188170	P C Board Assy, TERMINAL 1		
e UF01	70188170	P C Board Assy, TERMINAL 1		
f UF01	70188267	P C Board Assy, TERMINAL 1		
		- DIODES -		
DF01	A7160570	Diode	1SS176	
DF02	A7160570	Diode	1SS176	
DF03	A7160570	Diode	1SS176	
DF04	A7160570	Diode	1SS176	
DF05	A7160570	Diode	1SS176	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
DF06	A7160570	Diode	1SS176	
DF07	A7160570	Diode	1SS176	
DF08	A7160570	Diode	1SS176	
		- CAPACITORS -		
CF01	24793471	Cap, Electrolytic	470MF	M 10V
CF02	24538223	Cap, Plastic	0. 022MF	J 50V
CF03	24793471	Cap, Electrolytic	470MF	M 10V
		- RESISTORS -		
RF01	24366681	Res, Carbon	680	J 1/6W
RF02	24366750	Res, Carbon	75	J 1/6W
RF03	24366820	Res, Carbon	82	J 1/6W
RF04	24366751	Res, Carbon	750	J 1/6W
RF05	24366750	Res, Carbon	75	J 1/6W
RF06	24366820	Res, Carbon	82	J 1/6W
RF07	24366223	Res, Carbon	22K	J 1/6W
RF13	24366224	Res, Carbon	220K	J 1/6W
RF17	24366152	Res, Carbon	1. 5K	J 1/6W
RF18	24366152	Res, Carbon	1. 5K	J 1/6W
RF19	24366473	Res, Carbon	47K	J 1/6W
RF24	24366152	Res, Carbon	1. 5K	J 1/6W
RF25	24366152	Res, Carbon	1. 5K	J 1/6W
RF26	24366473	Res, Carbon	47K	J 1/6W
RF29	24366224	Res, Carbon	220K	J 1/6W
		- MISCELLANEOUS -		
P203B	23901622	Socket, 12P		
P703B	23901623	Socket, 11P		
PF01	23116334	Socket, 21P		
PF02	23116335	Socket, 21P		
SF01	23145412	Slide Switch, 2C2P		
b SF02	23145412	Slide Switch, 2C2P		
d SF02	23145412	Slide Switch, 2C2P		
e SF02	23145412	Slide Switch, 2C2P		
■ UF02	70188175	P C Board Assy, TERMINAL 2		
		- INTEGRATED CIRCUIT -		
ICF41	70128310	IC	BA7611N	
ICF42	70128310	IC	BA7611N	
ICF43	70119857	IC	BA7021	
ICF71	B0470532	IC	TC4053BP	
ICF72	B0350410	IC	TA75557S	
ICF73	B0350410	IC	TA75557S	
ICF74	70119686	IC	M5201L	
		- TRANSISTORS -		
QF44	A6534430	Transistor	2SA1048-Y	
QF45	A6534430	Transistor	2SA1048-Y	
QF46	A6002020	Transistor	RN1202	
QF47	A6002030	Transistor	RN1203	
QF48	A6002010	Transistor	RN1201	
QF49	A6012020	Transistor	RN2202	
QF75	A6002040	Transistor	RN1204	
QF76	A6002040	Transistor	RN1204	
QF77	A6002040	Transistor	RN1204	
		- DIODES -		
DF41	A7160570	Diode	1SS176	
DF42	A7160570	Diode	1SS176	
DF43	A7160570	Diode	1SS176	
DF44	A7160570	Diode	1SS176	
DF45	A7160570	Diode	1SS176	
DF46	A7160570	Diode	1SS176	
DF47	A7160570	Diode	1SS176	
DF48	A7160570	Diode	1SS176	
DF49	A7160570	Diode	1SS176	
DF50	A7160570	Diode	1SS176	
DF51	A7160570	Diode	1SS176	
DF52	A7160570	Diode	1SS176	
DF53	A7160570	Diode	1SS176	
DF54	A7160570	Diode	1SS176	
DF55	A7160570	Diode	1SS176	
DF71	23316270	Diode	DA218S	
DF72	23316270	Diode	DA218S	
DF74	A7160570	Diode	1SS176	
DF75	A7160570	Diode	1SS176	
		- COILS -		
LF41	23238910	Coil, Peaking	TRF4101AC	
		- CAPACITORS -		

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
CF41	24206010	Cap, Electrolytic	1MF	M 50V
CF42	24474103	Cap, Ceramic	0. 01MF	N 50V
CF43	24474103	Cap, Ceramic	0. 01MF	N 50V
CF44	24206010	Cap, Electrolytic	1MF	M 50V
CF45	24201470	Cap, Electrolytic	47MF	M 6. 3V
CF46	24203470	Cap, Electrolytic	47MF	M 16V
CF47	24201470	Cap, Electrolytic	47MF	M 6. 3V
CF48	24474103	Cap, Ceramic	0. 01MF	N 50V
CF49	24206010	Cap, Electrolytic	1MF	M 50V
CF50	24203470	Cap, Electrolytic	47MF	M 16V
CF60	24206228	Cap, Electrolytic	0. 22MF	M 50V
CF61	24474103	Cap, Ceramic	0. 01MF	N 50V
CF62	24206010	Cap, Electrolytic	1MF	M 50V
CF63	24206010	Cap, Electrolytic	1MF	M 50V
CF64	24474103	Cap, Ceramic	0. 01MF	N 50V
CF65	24474103	Cap, Ceramic	0. 01MF	N 50V
CF66	24474103	Cap, Ceramic	0. 01MF	N 50V
CF67	24201470	Cap, Electrolytic	47MF	M 6. 3V
CF68	24474103	Cap, Ceramic	0. 01MF	N 50V
CF69	24206010	Cap, Electrolytic	1MF	M 50V
CF71	24203470	Cap, Electrolytic	47MF	M 16V
CF72	24203470	Cap, Electrolytic	47MF	M 16V
CF73	24203470	Cap, Electrolytic	47MF	M 16V
CF74	24205479	Cap, Electrolytic	4. 7MF	M 35V
CF75	24205479	Cap, Electrolytic	4. 7MF	M 35V
CF76	24205479	Cap, Electrolytic	4. 7MF	M 35V
CF77	24205479	Cap, Electrolytic	4. 7MF	M 35V
CF78	24205479	Cap, Electrolytic	4. 7MF	M 35V
CF79	24203100	Cap, Electrolytic	10MF	M 16V
CF80	24203100	Cap, Electrolytic	10MF	M 16V
CF81	24203100	Cap, Electrolytic	10EF	M 16V
CF82	24203100	Cap, Electrolytic	10MF	M 16V
CF83	24538393	Cap, Plastic	0. 039MF	J 50V
		- RESISTORS -		
RF41	24366561	Res, Carbon	560	J 1/6W
RF42	24366102	Res, Carbon	1K	J 1/6W
RF43	24366101	Res, Carbon	100	J 1/6W
RF44	24366561	Res, Carbon	560	J 1/6W
RF45	24367102	Res, Carbon	1K	G 1/6W
RF46	24367102	Res, Carbon	1K	G 1/6W
RF47	24366472	Res, Carbon	4. 7K	J 1/6W
RF48	24366101	Res, Carbon	100	J 1/6W
RF49	24366102	Res, Carbon	1K	J 1/6W
RF50	24366561	Res, Carbon	560	J 1/6W
RF51	24366561	Res, Carbon	560	J 1/6W
RF52	24366562	Res, Carbon	5. 6K	J 1/6W
RF53	24366332	Res, Carbon	3. 3K	J 1/6W
RF54	24366272	Res, Carbon	2. 7K	J 1/6W
RF60	24366102	Res, Carbon	1K	J 1/6W
RF61	24366102	Res, Carbon	1K	J 1/6W
RF63	24366273	Res, Carbon	27K	J 1/6W
RF64	24366183	Res, Carbon	18K	J 1/6W
RF65	24367751	Res, Carbon	750	G 1/6W
RF66	24367821	Res, Carbon	820	G 1/6W
RF67	24366103	Res, Carbon	10K	J 1/6W
RF68	24366472	Res, Carbon	4. 7K	J 1/6W
RF69	24366472	Res, Carbon	4. 7K	J 1/6W
RF71	24366561	Res, Carbon	560	J 1/6W
RF72	24366223	Res, Carbon	22K	J 1/6W
RF73	24366273	Res, Carbon	27K	J 1/6W
RF74	24366333	Res, Carbon	33K	J 1/6W
RF75	24366333	Res, Carbon	33K	J 1/6W
RF76	24366333	Res, Carbon	33K	J 1/6W
RF77	24366333	Res, Carbon	33K	J 1/6W
RF78	24366333	Res, Carbon	33K	J 1/6W
RF79	24366333	Res, Carbon	33K	J 1/6W
RF80	24366333	Res, Carbon	33K	J 1/6W
RF81	24366152	Res, Carbon	1. 5K	J 1/6W
RF82	24366103	Res, Carbon	10K	J 1/6W
RF83	24366103	Res, Carbon	10K	J 1/6W
RF84	24366103	Res, Carbon	10K	J 1/6W
RF85	24366103	Res, Carbon	10K	J 1/6W
RF86	24366224	Res, Carbon	220K	J 1/6W
RF87	24366224	Res, Carbon	220K	J 1/6W
RF88	24366333	Res, Carbon	33K	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
RF90	24366333	Res, Carbon	33K	J 1/6W
		- MISCELLANEOUS -		
PF41	23367433	Plug, 14P		
■UV01	70188176	P C Board Assy, PRE AMP		
		- INTEGRATED CIRCUIT -		
ICV01	70119856	IC	AN3313	
		- TRANSISTORS -		
QV02	A6332430	Transistor	2SC2458-Y	
QV03	A6332430	Transistor	2SC2458-Y	
QV04	A6332430	Transistor	2SC2458-Y	
QV05	A6332430	Transistor	2SC2458-Y	
QV06	A6332430	Transistor	2SC2458-Y	
QV07	A6332430	Transistor	2SC2458-Y	
QV08	A6332430	Transistor	2SC2458-Y	
QV09	A6534040	Transistor	2SA1015-Y	
QV10	A6317440	Transistor	2SC1815-Y	
QV11	A6002060	Transistor	RN1206	
		- COILS -		
LV01	23238910	Coil, Peaking	TRF4101AC	
LV02	23238562	Coil, Peaking	TRF4109AJ	
LV03	23238705	Coil, Peaking	TRF4560AJ	
LV04	23238926	Coil, Peaking	TRF4479AC	
LV05	23238703	Coil, Peaking	TRF4820AJ	
LV06	23237819	Coil, Peaking	TRF4561AC	
		- CAPACITORS -		
CV01	24630948	Cap, Electrolytic	10MF	M 16V
# CV02	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CV03	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CV04	24232103	Cap, Ceramic	0. 01MF	Z 50V
CV05	24206010	Cap, Electrolytic	1MF	M 50V
# CV06	24232103	Cap, Ceramic	0. 01MF	Z 50V
CV07	24201470	Cap, Electrolytic	47MF	M 6. 3V
CV08	24206010	Cap, Electrolytic	1MF	M 50V
CV09	24206010	Cap, Electrolytic	1MF	M 50V
CV10	24206010	Cap, Electrolytic	1MF	M 50V
# CV11	24436270	Cap, Ceramic	27PF	J 50V
CV12	24206010	Cap, Electrolytic	1MF	M 50V
CV13	24201470	Cap, Electrolytic	47MF	M 6. 3V
# CV14	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CV15	24232103	Cap, Ceramic	0. 01MF	Z 50V
CV16	24436181	Cap, Ceramic	180PF	J 50V
CV17	24436470	Cap, Ceramic	47PF	J 50V
# CV18	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CV19	24473569	Cap, Ceramic	5. 6PF	K 50V
# CV20	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CV21	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CV22	24232103	Cap, Ceramic	0. 01MF	Z 50V
CV23	24206010	Cap, Electrolytic	1MF	M 50V
CV24	24203470	Cap, Electrolytic	47MF	M 16V
# CV25	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CV26	24232103	Cap, Ceramic	0. 01MF	Z 50V
		- RESISTORS -		
# RV01	24360821	Res, Carbon	820	J 1/8W
# RV02	24360682	Res, Carbon	6. 8K	J 1/8W
# RV03	24360102	Res, Carbon	1K	J 1/8W
# RV04	24360682	Res, Carbon	6. 8K	J 1/8W
# RV05	24360102	Res, Carbon	1K	J 1/8W
# RV06	24360682	Res, Carbon	6. 8K	J 1/8W
# RV07	24360102	Res, Carbon	1K	J 1/8W
# RV08	24360821	Res, Carbon	820	J 1/8W
# RV09	24360821	Res, Carbon	820	J 1/8W
# RV10	24360152	Res, Carbon	1. 5K	J 1/8W
# RV11	24360472	Res, Carbon	4. 7K	J 1/8W
# RV12	24360101	Res, Carbon	100	J 1/8W
# RV13	24360102	Res, Carbon	1K	J 1/8W
# RV14	24360102	Res, Carbon	1K	J 1/8W
# RV15	24360102	Res, Carbon	1K	J 1/8W
# RV16	24360102	Res, Carbon	1K	J 1/8W
# RV17	24360102	Res, Carbon	1K	J 1/8W
# RV18	24360102	Res, Carbon	1K	J 1/8W
# RV19	24360222	Res, Carbon	2. 2K	J 1/8W
RV20	24366273	Res, Carbon	27K	J 1/6W
# RV21	24360472	Res, Carbon	4. 7K	J 1/8W
# RV22	24360751	Res, Carbon	750	J 1/8W

	LOCATION NUMBER	PART NUMBER	DESCRIPTION		
#	RV23	24360153	Res, Carbon	15K	J 1/8W
#	RV24	24360820	Res, Carbon	82	J 1/8W
#	RV25	24360202	Res, Carbon	2K	J 1/8W
#	RV26	24360511	Res, Carbon	510	J 1/8W
#	RV27	24930479	Res, Carbon	4.7	J 1/8W
#	RV28	24360102	Res, Carbon	1K	J 1/8W
#	RV29	24360332	Res, Carbon	3. 3K	J 1/6W
#	RV30	24360332	Res, Carbon	3. 3K	J 1/6W
#	RV31	24360102	Res, Carbon	1K	J 1/8W
	RV32	24367220	Res, Carbon	22	G 1/6W
	RV33	24367220	Res, Carbon	22	G 1/6W
			- MISCELLANEOUS -		
	PV01	23367992	Plug, 9P		
a	UX01	70188275	P C Board Assy, TIMER		
b	UX01	70188302	P C Board Assy, TIMER		
c	UX01	70188268	P C Board Assy, TIMER		
d	UX01	70188177	P C Board Assy, TIMER		
e	UX01	70188177	P C Board Assy, TIMER		
f	UX01	70188268	P C Board Assy, TIMER		
			- INTEGRATED CIRCUIT -		
	ICX01	70128263	IC	M50957-199SP	
	ICX02	70119913	IC	S8054ALR	
	ICX10	70128045	IC	ICT93C46	
			- TRANSISTORS -		
	QX03	A6332430	Transistor	2SC2458-Y	
	QX06	A6332430	Transistor	2SC2458-Y	
			- DIODES -		
	DX05	A7160590	Diode	1SS177	
	DX06	A7160590	Diode	1SS177	
	DX07	A7160590	Diode	1SS177	
	DX09	A7160590	Diode	1SS177	
	DX10	A7160590	Diode	1SS177	
	DX11	A7160590	Diode	1SS177	
b	DX12	A7160590	Diode	1SS177	
d	DX12	A7160590	Diode	1SS177	
e	DX12	A7160590	Diode	1SS177	
	DX13	A7160590	Diode	1SS177	
	DX14	A7160590	Diode	1SS177	
	DX15	A7160590	Diode	1SS177	
	DX17	A7160590	Diode	1SS177	
c	DX18	A7160590	Diode	1SS177	
d	DX18	A7160590	Diode	1SS177	
e	DX18	A7160590	Diode	1SS177	
f	DX18	A7160590	Diode	1SS177	
	DX19	A7160590	Diode	1SS177	
	DX21	A7160590	Diode	1SS177	
	DX24	A7160590	Diode	1SS177	
	DX26	A7160590	Diode	1SS177	
	DX28	A7160590	Diode	1SS177	
	DX31	A7160590	Diode	1SS177	
	DX33	A7160590	Diode	1SS177	
			- CAPACITORS -		
	CX01	24630858	Cap, Electrolytic	47MF	M 10V
	CX03	24474101	Cap, Ceramic	100PF	K 50V
	CX04	24474101	Cap, Ceramic	100PF	K 50V
	CX05	24472100	Cap, Ceramic	10PF	J 50V
	CX06	24473300	Cap, Ceramic	30PF	J 50V
	CX08	24474103	Cap, Ceramic	0. 01MF	N 50V
	CX09	24474103	Cap, Ceramic	0. 01MF	N 50V
	CX10	24794470	Cap, Electrolytic	47MF	M 16V
	CX11	24474103	Cap, Ceramic	0. 01MF	N 50V
	CX28	24630852	Cap, Electrolytic	22MF	M 16V
	CX29	24474103	Cap, Ceramic	0. 01MF	N 50V
			- RESISTORS -		
	RX01	24366223	Res, Carbon	22K	J 1/6W
	RX02	24366223	Res, Carbon	22K	J 1/6W
	RX03	24366223	Res, Carbon	22K	J 1/6W
	RX04	24366223	Res, Carbon	22K	J 1/6W
	RX05	24366103	Res, Carbon	10K	J 1/6W
	RX06	24366103	Res, Carbon	10K	J 1/6W
	RX07	24366103	Res, Carbon	10K	J 1/6W
	RX08	24366103	Res, Carbon	10K	J 1/6W
	RX09	24366223	Res, Carbon	22K	J 1/6W
	RX10	24366101	Res, Carbon	100	J 1/6W

	LOCATION NUMBER	PART NUMBER	DESCRIPTION		
	RX11	24366103	Res, Carbon	10K	J 1/6W
	RX12	24366102	Res, Carbon	1K	J 1/6W
c	RX14	24366221	Res, Carbon	220	J 1/6W
d	RX14	24366221	Res, Carbon	220	J 1/6W
e	RX14	24366221	Res, Carbon	220	J 1/6W
f	RX14	24366221	Res, Carbon	220	J 1/6W
	RX15	24366221	Res, Carbon	220	J 1/6W
	RX16	24366221	Res, Carbon	220	J 1/6W
	RX17	24366221	Res, Carbon	220	J 1/6W
	RX18	24366223	Res, Carbon	22K	J 1/6W
	RX19	24366104	Res, Carbon	100K	J 1/6W
	RX20	24366223	Res, Carbon	22K	J 1/6W
	RX21	24366101	Res, Carbon	100	J 1/6W
	RX24	24366105	Res, Carbon	1M	J 1/6W
	RX25	24941515	Res, Composition	5. 1M	J 1/4W
	RX28	24366391	Res, Carbon	390	J 1/6W
	RX30	24366222	Res, Carbon	2. 2K	J 1/6W
	RX31	24366101	Res, Carbon	100	J 1/6W
	RX32	24366101	Res, Carbon	100	J 1/6W
	RX35	24366104	Res, Carbon	100K	J 1/6W
	RX36	24941515	Res, Composition	5. 1M	J 1/4W
	RX37	24366101	Res, Carbon	100	J 1/6W
b	RX38	24366101	Res, Carbon	100	J 1/6W
d	RX38	24366101	Res, Carbon	100	J 1/6W
e	RX38	24366101	Res, Carbon	100	J 1/6W
	RX39	24366102	Res, Carbon	1K	J 1/6W
	RX40	24366223	Res, Carbon	22K	J 1/6W
	RX44	24366101	Res, Carbon	100	J 1/6W
	RX49	24366223	Res, Carbon	22K	J 1/6W
	RX50	24366472	Res, Carbon	4. 7K	J 1/6W
	RX51	24366472	Res, Carbon	4. 7K	J 1/6W
	RX52	24366472	Res, Carbon	4. 7K	J 1/6W
	RX53	24366101	Res, Carbon	100	J 1/6W
	RX54	24366101	Res, Carbon	100	J 1/6W
	RX56	24366102	Res, Carbon	1K	J 1/6W
	RX57	24366473	Res, Carbon	47K	J 1/6W
	RX58	24366101	Res, Carbon	100	J 1/6W
	RX60	24366102	Res, Carbon	1K	J 1/6W
	RX62	24366473	Res, Carbon	47K	J 1/6W
			- MISCELLANEOUS -		
	GX01	70113124	FIP, 11-BT-53GYK		
	PX01A	23367716	Plug, 12P		
b	S202	23145532	Slide Switch, 2C3P		
d	S202	23145532	Slide Switch, 2C3P		
e	S202	23145532	Slide Switch, 2C3P		
	SL01	23344094	Push Switch		
	SX01	23344094	Push Switch		
	SX02	23344094	Push Switch		
	SX03	23344094	Push Switch		
	SX04	23344094	Push Switch		
	SX06	23344094	Push Switch		
	SX07	23344094	Push Switch		
	SX08	23344094	Push Switch		
	SX09	23344094	Push Switch		
	SX10	23344094	Push Switch		
	SX11	23344094	Push Switch		
	SX12	23344094	Push Switch		
	SX13	23344094	Push Switch		
	SX17	23344094	Push Switch		
	SX18	23344094	Push Switch		
	SX29	23344094	Push Switch		
	SX33	23145533	Slide Switch, 2C2P		
	WX02	70179894	Wire		
	WX02A	23902368	FFC, 17P		
	XX01	23153744	Resonator, 5MHz, CSA5. 00MG040		
	XX02	23153860	Crystal, 32. 768kHz		
	ZR01	23120599	F.U.	IR-9105-D	
c	ZR01	23120610	F.U.	IR-9101-K	
d	ZR01	23120610	F.U.	IR-9101-K	
e	ZR01	23120610	F.U.	IR-9101-K	
f	ZR01	23120610	F.U.	IR-9101-K	
	UI07	70198860	P C Board Assy, ACE HEAD		
			- RESISTORS -		
	RI71	24366100	Res, Carbon	10	J 1/6W

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
■UI04	70198868	P C Board Assy, MECHA BASE SUB		
		- TRANSISTORS -		
QI22	70114403	Transistor, Photo	PT439F	
QI51	A6090500	Hall Sensor	THS114	
		- MISCELLANEOUS -		
PI41	23902566	FPC, 6P		
SI25	23344089	Push Switch, 1C1P		
■UI05	70198867	P C Board Assy, MECHA BASE MAIN		
		- INTEGRATED CIRCUIT -		
ICI61	B0470212	IC	TC4021	
ICI62	B0349260	IC	TA75393P	
		- TRANSISTORS -		
QI41	A6090500	Hall Sensor	THS114	
		- DIODES -		
DI61	70115450	Diode, LED	GL451V	
		- CAPACITORS -		
CI61	24474103	Cap, Ceramic	0. 01MF	N 50V
CI81	24474103	Cap, Ceramic	0. 01MF	N 50V
CI82	24474103	Cap, Ceramic	0. 01MF	N 50V
CI86	24474103	Cap, Ceramic	0. 01MF	N 50V
CI87	24474103	Cap, Ceramic	0. 01MF	N 50V
		- RESISTORS -		
RI60	24366472	Res, Carbon	4. 7K	J 1/6W
RI61	24366472	Res, Carbon	4. 7K	J 1/6W
RI62	24366472	Res, Carbon	4. 7K	J 1/6W
RI63	24366472	Res, Carbon	4. 7K	J 1/6W
RI65	24366472	Res, Carbon	4. 7K	J 1/6W
RI66	24366273	Res, Carbon	27K	J 1/6W
RI67	24366683	Res, Carbon	68K	J 1/6W
RI68	24366472	Res, Carbon	4. 7K	J 1/6W
RI70	24366103	Res, Carbon	10K	J 1/6W
RI71	24366103	Res, Carbon	10K	J 1/6W
RI72	24366103	Res, Carbon	10K	J 1/6W
RI73	24366103	Res, Carbon	10K	J 1/6W
RI75	24366103	Res, Carbon	10K	J 1/6W
RI76	24366103	Res, Carbon	10K	J 1/6W
RI77	24366103	Res, Carbon	10K	J 1/6W
RI78	24366103	Res, Carbon	10K	J 1/6W
RI80	24366151	Res, Carbon	150	J 1/6W
RI81	24366561	Res, Carbon	560	J 1/6W
RI82	24366561	Res, Carbon	560	J 1/6W
RI83	24366103	Res, Carbon	10K	J 1/6W
RI84	24366334	Res, Carbon	330K	J 1/6W
RI85	24366103	Res, Carbon	10K	J 1/6W
RI86	24366334	Res, Carbon	330K	J 1/6W
RI87	24366151	Res, Carbon	150	J 1/6W
RI88	24366151	Res, Carbon	150	J 1/6W
RI89	24366151	Res, Carbon	150	J 1/6W
		- MISCELLANEOUS -		
PI51	23901261	Socket, 18P		
PI52	23902570	FPC, 10P		
PI53	23902566	FPC, 6P		
PI54	23902593	FPC, 5P		
WI21	70179392	Wire		
■UI08	70198858	P C Board Assy, LOADING M(T)		
■UI02	70198857	P C Board Assy, FL RELAY		
		- TRANSISTORS -		
QI21	70114404	Transistor, Photo	PT361F	
		- MISCELLANEOUS -		
SI22	70145382	FL Switch		
c ■UE01	70188266	P C Board Assy, OSP		
f UE01	70188266	P C Board Assy, OSP		
		- INTEGRATED CIRCUIT -		
ICE01	70128070	IC	M50552-082SP	
ICE02	70128265	IC	LVA519S	
ICE61	B0325390	IC	TA7347P	
		- TRANSISTORS -		
QE03	A6534430	Transistor	2SA1048-Y	
QE04	A6332430	Transistor	2SC2458-Y	
QE05	A6002040	Transistor	RN1204	

LOCATION NUMBER	PART NUMBER	DESCRIPTION		
QE06	A6002040	Transistor	RN1204	
QE62	A6534430	Transistor	2SA1048-Y	
QE63	A6534430	Transistor	2SA1048-Y	
QE64	A6534430	Transistor	2SA1048-Y	
		- DIODES -		
DE02	A7151450	Diode	1SS200	
		- COILS -		
LE01	23238562	Coil, Peaking	TRF4109AJ	
LE51	23262744	Coil, IF	TRF1131	
LE61	23237976	Coil, Peaking	TRF4820AC	
LE62	23237985	Coil, Peaking	TRF4150AC	
		- CAPACITORS -		
CE03	24201470	Cap, Electrolytic	47MF	M 6.3V
CE05	24201470	Cap, Electrolytic	47MF	M 6.3V
CE09	24206010	Cap, Electrolytic	1MF	M 50V
CE10	24203470	Cap, Electrolytic	47MF	M 16V
CE11	24203220	Cap, Electrolytic	22MF	M 16V
CE12	24203470	Cap, Electrolytic	47MF	M 16V
# CE13	24212101	Cap, Ceramic	100PF	K 50V
# CE14	24436680	Cap, Ceramic	68PF	J 50V
CE15	24591104	Cap, Plastic	0. 1MF	J 50V
CE16	24591223	Cap, Plastic	0. 022MF	J 50V
CE17	24206010	Cap, Electrolytic	1MF	M 50V
CE18	24591332	Cap, Plastic	3300PF	J 50V
CE19	24591561	Cap, Plastic	560PF	J 50V
CE61	24203470	Cap, Electrolytic	47MF	M 16V
# CE63	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CE64	24232103	Cap, Ceramic	0. 01MF	Z 50V
# CE65	24232103	Cap, Ceramic	0. 01MF	Z 50V
CE66	24353100	Cap, Ceramic	10PF	J 50V
CE67	24353121	Cap, Ceramic	120PF	J 50V
CE68	24203470	Cap, Electrolytic	47MF	M 16V
CE69	24205479	Cap, Electrolytic	4. 7MF	M 35V
		- RESISTORS -		
# RE01	24360223	Res, Carbon	22K	J 1/8W
# RE02	24360223	Res, Carbon	22K	J 1/8W
# RE03	24360223	Res, Carbon	22K	J 1/8W
# RE04	24360102	Res, Carbon	1K	J 1/8W
# RE05	24360102	Res, Carbon	1K	J 1/8W
# RE06	24360102	Res, Carbon	1K	J 1/8W
# RE07	24360101	Res, Carbon	100	J 1/8W
# RE08	24360272	Res, Carbon	2. 7K	J 1/8W
# RE09	24360102	Res, Carbon	1K	J 1/8W
# RE10	24360103	Res, Carbon	10K	J 1/8W
# RE11	24360821	Res, Carbon	820	J 1/8W
# RE12	24360332	Res, Carbon	3. 3K	J 1/6W
# RE13	24360105	Res, Carbon	1M	J 1/8W
# RE14	24360752	Res, Carbon	7. 5K	J 1/8W
# RE15	24360273	Res, Carbon	27K	J 1/8W
# RE16	24360103	Res, Carbon	10K	J 1/8W
# RE17	24360272	Res, Carbon	2. 7K	J 1/8W
# RE18	24360472	Res, Carbon	4. 7K	J 1/8W
# RE19	24360103	Res, Carbon	10K	J 1/8W
# RE20	24360103	Res, Carbon	10K	J 1/8W
# RE21	24360102	Res, Carbon	1K	J 1/8W
# RE22	24360102	Res, Carbon	1K	J 1/8W
RE23	24366562	Res, Carbon	5. 6K	J 1/6W
RE51	24066953	Res, Variable	100K	
# RE61	24360472	Res, Carbon	4. 7K	J 1/8W
# RE62	24360104	Res, Carbon	100K	J 1/8W
# RE63	24360332	Res, Carbon	3. 3K	J 1/6W
# RE64	24360132	Res, Carbon	1. 3K	J 1/8W
# RE65	24360152	Res, Carbon	1. 5K	J 1/8W
RE66	24367391	Res, Carbon	390	G 1/6W
# RE67	24360333	Res, Carbon	33K	J 1/8W
# RE68	24360133	Res, Carbon	13K	J 1/8W
# RE69	24360122	Res, Carbon	1. 2K	J 1/8W
RE70	24367242	Res, Carbon	2. 4K	G 1/6W
RE71	24367202	Res, Carbon	2K	G 1/6W
# RE72	24360471	Res, Carbon	470	J 1/8W
# RE73	24360133	Res, Carbon	13K	J 1/8W
# RE74	24360333	Res, Carbon	33K	J 1/8W
# RE75	24360102	Res, Carbon	1K	J 1/8W
# RE76	24360333	Res, Carbon	33K	J 1/8W
# RE79	24360103	Res, Carbon	10K	J 1/8W

	LOCATION NUMBER	PART NUMBER	DESCRIPTION		
			- MISCELLANEOUS -		
	PE01	23367433	Plug, 14P		
	XE01	23153729	Crystal		
	⚠ZE01	23118122	IC Protector, ICP-N5		
d	■UE01	70188169	P C Board Assy, OSP		
e	UE01	70188169	P C Board Assy, OSP		
			- INTEGRATED CIRCUIT -		
	ICE01	70128070	IC	M50552-082SP	
	ICE02	70128265	IC	LVA519S	
	ICE61	B0325390	IC	TA7347P	
			- TRANSISTORS -		
	QE03	A6534430	Transistor	2SA1048-Y	
	QE04	A6332430	Transistor	2SC2458-Y	
	QE05	A6002040	Transistor	RN1204	
	QE06	A6002040	Transistor	RN1204	
	QE62	A6534430	Transistor	2SA1048-Y	
	QE63	A6534430	Transistor	2SA1048-Y	
	QE64	A6534430	Transistor	2SA1048-Y	
			- DIODES -		
	DE02	A7151450	Diode	1SS200	
			- COILS -		
	LE01	23238562	Coil, Peaking	TRF4109AJ	
	LE31	23238709	Coil, Peaking	TRF4270AJ	
	LE51	23262744	Coil, IF	TRF1131	
	LE61	23237976	Coil, Peaking	TRF4820AC	
	LE62	23237985	Coil, Peaking	TRF4150AC	
			- CAPACITORS -		
	CE01	24436070	Cap, Ceramic	7PF	J 50V
#	CE02	24436229	Cap, Chip	2.2PF	K 50V
	CE03	24201470	Cap, Electrolytic	47MF	M 6.3V
	CE05	24201470	Cap, Electrolytic	47MF	M 6.3V
	CE09	24206010	Cap, Electrolytic	1MF	M 50V
	CE10	24203470	Cap, Electrolytic	47MF	M 16V
	CE11	24203220	Cap, Electrolytic	22MF	M 16V
	CE12	24203470	Cap, Electrolytic	47MF	M 16V
#	CE13	24212101	Cap, Ceramic	100PF	K 50V
#	CE14	24436680	Cap, Ceramic	68PF	J 50V
	CE15	24591104	Cap, Plastic	0.1MF	J 50V
	CE16	24591223	Cap, Plastic	0.022MF	J 50V
	CE17	24206010	Cap, Electrolytic	1MF	M 50V
	CE18	24591332	Cap, Plastic	3300PF	J 50V
	CE19	24591561	Cap, Plastic	560PF	J 50V
#	CE31	24436561	Cap, Ceramic	560PF	K 50V
#	CE32	24436561	Cap, Ceramic	560PF	K 50V
#	CE34	24436120	Cap, Ceramic	12PF	J 50V
	CE51	24093983	Cap, Variable	2.7PF	
	CE61	24203470	Cap, Electrolytic	47MF	M 16V
#	CE63	24232103	Cap, Ceramic	0.01MF	Z 50V
#	CE64	24232103	Cap, Ceramic	0.01MF	Z 50V
#	CE65	24232103	Cap, Ceramic	0.01MF	Z 50V
	CE66	24353100	Cap, Ceramic	10PF	J 50V
	CE67	24353121	Cap, Ceramic	120PF	J 50V
	CE68	24203470	Cap, Electrolytic	47MF	M 16V
	CE69	24205479	Cap, Electrolytic	4.7MF	M 35V
			- RESISTORS -		
#	RE01	24360223	Res, Carbon	22K	J 1/8W
#	RE02	24360223	Res, Carbon	22K	J 1/8W
#	RE03	24360223	Res, Carbon	22K	J 1/8W
#	RE04	24360102	Res, Carbon	1K	J 1/8W
#	RE05	24360102	Res, Carbon	1K	J 1/8W
#	RE06	24360102	Res, Carbon	1K	J 1/8W
#	RE07	24360101	Res, Carbon	100	J 1/8W
#	RE08	24360272	Res, Carbon	2.7K	J 1/8W
#	RE09	24360102	Res, Carbon	1K	J 1/8W
#	RE10	24360103	Res, Carbon	10K	J 1/8W
#	RE11	24360821	Res, Carbon	820	J 1/8W
#	RE12	24360332	Res, Carbon	3.3K	J 1/6W
#	RE13	24360105	Res, Carbon	1M	J 1/8W
#	RE14	24360752	Res, Carbon	7.5K	J 1/8W
#	RE15	24360273	Res, Carbon	27K	J 1/8W
#	RE16	24360103	Res, Carbon	10K	J 1/8W
#	RE17	24360272	Res, Carbon	2.7K	J 1/8W
#	RE18	24360472	Res, Carbon	4.7K	J 1/8W
#	RE19	24360103	Res, Carbon	10K	J 1/8W

	LOCATION NUMBER	PART NUMBER	DESCRIPTION		
#	RE20	24360103	Res, Carbon	10K	J 1/8W
#	RE21	24360102	Res, Carbon	1K	J 1/8W
#	RE22	24360102	Res, Carbon	1K	J 1/8W
	RE23	24366562	Res, Carbon	5.6K	J 1/6W
	RE31	24366472	Res, Carbon	4.7K	J 1/6W
#	RE32	24360472	Res, Carbon	4.7K	J 1/8W
	RE51	24066953	Res, Variable	100K	
#	RE61	24360472	Res, Carbon	4.7K	J 1/8W
#	RE62	24360104	Res, Carbon	100K	J 1/8W
#	RE63	24360332	Res, Carbon	3.3K	J 1/6W
#	RE64	24360132	Res, Carbon	1.3K	J 1/8W
#	RE65	24360152	Res, Carbon	1.5K	J 1/8W
	RE66	24367391	Res, Carbon	390	G 1/6W
#	RE67	24360333	Res, Carbon	33K	J 1/8W
#	RE68	24360133	Res, Carbon	13K	J 1/8W
#	RE69	24360122	Res, Carbon	1.2K	J 1/8W
	RE70	24367242	Res, Carbon	2.4K	G 1/6W
	RE71	24367202	Res, Carbon	2K	G 1/6W
#	RE72	24360471	Res, Carbon	470	J 1/8W
#	RE73	24360133	Res, Carbon	13K	J 1/8W
#	RE74	24360333	Res, Carbon	33K	J 1/8W
#	RE75	24360102	Res, Carbon	1K	J 1/8W
#	RE76	24360333	Res, Carbon	33K	J 1/8W
			- MISCELLANEOUS -		
	XE01	23153729	Crystal		
	ZE01	23118122	IC Protector, ICP-N5		

MECHANICAL PARTS

	A101	70884051	Front Panel
b	A101	70884056	Front Panel
c	A101	70884054	Front Panel
d	A101	70884049	Front Panel
e	A101	70884068	Front Panel
f	A101	70884069	Front Panel
	A101A	70391412	Screw, 3x12mm
e	A101A	23721308	Screw, 3x8mm
f	A101A	23721308	Screw, 3x8mm
c	A101F	70868242	Door
d	A101F	70868236	Door
e	A101F	70868259	Door
f	A101F	70868260	Door
	A101H	70868194	Door
b	A101H	70868246	Door
c	A101H	--------	
d	A101H	--------	
e	A101H	--------	
f	A101H	--------	
c	A101P	70866631	Door Spring
d	A101P	70866631	Door Spring
e	A101P	70866631	Door Spring
f	A101P	70866631	Door Spring
	A103A	70868238	Cassette Door
c	A103A	70868244	Cassette Door
d	A103A	70868234	Cassette Door
e	A103A	70868257	Cassette Door
f	A103A	70868262	Cassette Door
	A103B	70351848	Spring
c	A103B	70351857	Spring
d	A103B	70351857	Spring
e	A103B	70351857	Spring
f	A103B	70351857	Spring
	A103C	70866646	Lock Plate
	A103D	70866647	Lock Plate
	A103E	70391443	Screw, 2x6mm
	A104	70824310	Top Cover
b	A104	70824307	Top Cover
c	A104	70824307	Top Cover
d	A104	70824307	Top Cover
	A104C	70391414	Screw, 3x8mm
	A106	70826431	Knob
	A120	70815204	Bottom Cover
	A701	70917436	Case
b	A701	70917444	Case
c	A701	70917439	Case

	LOCATION NUMBER	PART NUMBER	DESCRIPTION
d	A701	70917428	Case
e	A701	70917466	Case
f	A701	70917468	Case
	A702	70921350	Packing(U)
	A703	70921351	Packing(B)
	A708	70915052	Sheet
	AT01	70108595	Case(U)
c	AT01	70108632	Case(L)
d	AT01	70108632	Case(L)
e	AT01	70108578	Case(U)
f	AT01	70108650	Case(U)
	AT02	70108596	Case(L)
c	AT02	70108577	Case(L)
d	AT02	70108577	Case(L)
e	AT02	70108636	Case(L)
f	AT02	70108636	Case(L)
	AT03	70108521	Case(Battery)
	AT04	70108522	Filter
	B000A	70391081	Screw, 4x12mm
	B111	70323327	Pinch Assy
	B112	70396196	Washer, FI 3. 6x8x 0. 5mm
	B120	70328360	Tension Regulator Assy
	B127	70351904	Spring
	B128	23721310	Screw, 3x10mm
	B140	70328366	FL Drive Gear Assy
	B141	70396284	Washer, 4.0x1.6x0.35mm
	B142	70363382	Lever
	B143	70351845	Spring
	B144	70363383	Lever
	B145	70351846	Spring
	B171	23712308	Screw, 3x0. 5x8mm
	B173	23712308	Screw, 3x0. 5x8mm
	B174	70391334	Screw, 3x8mm
	B231	70325231	Earth Brush Assy
	B232	70391345	Screw, 3x3mm
	B501	70333298	Supply Loading Gear
	B502	70322431	Link Assy
	B503	70351875	Spring
	B504	70333329	Take Up Loading Gear
	B505	70322432	Link Assy
	B506	70351876	Spring
	B507	70361335	Cap
	B509	70391334	Screw, 3x8mm
	B513	70331164	Cam
	B515	70322430	Lever Assy
	B516	70396196	Washer, FI 3. 6x8x 0. 5mm
	B518	70376400	Slider
	B520	70323329	Lever Assy
	B521	70347034	Polislider 4. 1x 6. 5x 0. 50mm
	B524	70376407	Connector
	B526	70323340	Cam Lever Assy
	B534	70366017	Slider
	B535	70351847	Spring
	B538	70376408	Connector
	B539	70351873	Spring
	B540	70363385	Lever
	B550	70312231	Loading Drive Assy
	B555	70351874	Spring
	B556	70312232	Loading Motor Assy
	B557	23723304	Screw, 3x4mm
	B558	70342131	Belt
	B562	70396191	Washer, FI 2. 1x5x 0. 5mm
	B571	70391334	Screw, 3x8mm
	B601B	70862380	Rubber
	BM31	70125291	Motor Assy
	⚠F801	23144826	Fuse, 0.5A, 250V
	⚠F802	23144129	Fuse, 2A
	G001	70311477	Cylinder Assy, C6S2P
	G001A	23723308	Screw, 3x8mm
	G101	70325087	Upper Cylinder Assy
	G103	70325171	Earth Cap
	G103S	70903022	Earth Brush Kit
	G104	70325315	Lower Cylinder Assy
	G202	70363423	Lever
	G205	70351877	Spring

	LOCATION NUMBER	PART NUMBER	DESCRIPTION
	G206	70348229	Inpedance Roller
	G207	70368208	Flange
	G208	70338172	Sleeve
	G210	70393025	NUT, 3x3mm
	G218	70379067	Guide Sleeve
	G221	70368168	Cap
	G224	70328389	ACE Main Base Assy
	G225	70182063	ACE Head Sub Assy
	G225A	70182097	ACE Sub Base
	G230	70378601	Shaft
	G231	70351665	Spring
	G232	23002250	E-ring
	G233	23712308	Screw, 3x0. 5x8mm
	G234	70391322	Adjust Screw
	G236	70351878	Spring
	G237	70393026	Nut, 3x4. 5mm
	G239	70392018	Taper Nut
	G251	70351842	Spring
	G252	70393025	NUT, 3x3mm
	G404	70322434	Slider Assy
	G407	70322438	Roller Assy
	G408	70391570	Screw, 2x3mm
	G409	70353115	O-ring
	G414	70322437	Slider Assy
	G417	70322435	Roller Assy
	G418	70391570	Screw, 2x3mm
	G419	70353115	O-ring
	H001	70121088	Tuner, EF431L
	H002	70123152	RF MOD., MSF252
b	H002	70123178	RF MOD, MSF262X1
d	H002	70123178	RF MOD, MSF262X1
e	H002	70123178	RF MOD, MSF262X1
	H002C	23721305	Screw, 3x5mm
	H032	70183018	FE Head
	K003A	23712308	Screw, 3x0. 5x8mm
	K003B	70342133	Belt
	K102	70391334	Screw, 3x8mm
	K103	70391345	Screw, 3x3mm
	K110	70326627	Idle Gear Assy
	K110K	70351887	Spring
	K112	70326644	Clutch Assy
	K114	70326646	Gear Lever Assy
	K115A	70333302	Gear
	K115B	70333301	Gear
	K116	70351890	Spring
	K117	70391447	Screw, 2.6x3mm
	K118	70396057	Washer, 5.4x3.1x0.5mm
	K119	70396193	Washer, FI 2. 6x6x 0. 5mm
	K130	70342132	Belt
	K135	70373354	Bracket
	K140	70327115	S Reel Table Assy
	K141	70394200	Spacer
	K143	70363424	Lever
	K144	70351892	Spring
	K150	70327160	Take Up Reel Table Assy
	K151	70394200	Spacer
	K153	70326648	Reverse Brake Assy
	K154	70351893	Spring
	K160	70326649	Supply Brake Assy
	K161	70326650	Take Up Brake Assy
	K162	70351894	Spring
	K301	70314306	Front Loading Assy
	K312H	70351882	Spring
	K317	70366047	Slider
	K331	70324409	Bracket
	K332	23712308	Screw, 3x0. 5x8mm
	K335	70324408	Front Loading Worm Assy
	K335C	70338075	Bearing
	K335D	70394153	Spacer
	K336	70363426	Opener
	K337	70363393	Lever
	K338	70351879	Spring
	K341	70333331	Gear
	K342	70351883	Spring
	K343	70351884	Spring

	LOCATION NUMBER	PART NUMBER	DESCRIPTION
	K344	70333332	Gear
	K345	70396195	Washer, FI 3. 6x6x 0. 5mm
	K346	70363425	Lever
	K347	70351885	Spring
	K361	70333334	Gear
	K362	70351886	Spring
	K363	70363416	Lever
	K364	70396247	Washer, 2. 6x8. 0x0. 5mm
	K371	70333333	Gear
	K372	70396248	Washer, 2. 6x5. 0x0. 5mm
	K373	70324425	Shaft Assy
	K375	23712308	Screw, 3x0. 5x8mm
	K377	23712308	Screw, 3x0. 5x8mm
	K379	23774305	Screw, 3X0. 5X5mm
	M002	70903039	Cylinder Motor
	⚠P801	23176621	Power Cord, 250V, 2. 5A
	⚠P801A	70846155	Cord Holder
	RG01	70213108	Dew Heater
	RI02	70325243	Dew Sensor Assy
	SI61	70145381	Cam Switch Assy
	ST01	70108594	Rubber
c	ST01	70108523	Rubber
d	ST01	70108523	Rubber
e	ST01	70108637	Rubber
f	ST01	70108637	Rubber
	⚠T802	23217039	Power Transformer, TPW1473AZ
	U202A	72471082	Screw, 3x10mm
	U601A	72471082	Screw, 3x10mm
	U801A	72471081	Screw, 3x8mm
	U802A	70391381	Screw, 2. 3x6mm
	UF01A	72471082	Screw, 3x10mm
	UT01	23335535	P C Board Assy, Remote Control
c	UT01	23335505	P C Board Assy, Remote Control
d	UT01	23335505	P C Board Assy, Remote Control
e	UT01	23335505	P C Board Assy, Remote Control
f	UT01	23335505	P C Board Assy, Remote Control
	V801A	70391081	Screw, 4x12mm
	V802A	70391355	Screw, 3x8mm
	VF01B	72471082	Screw, 3x10mm
	VF01C	72471082	Screw, 3x10mm
	VF01D	23721305	Screw, 3x5mm
	VV01B	70391347	Screw, 2. 6X5mm
	W211A	72471082	Screw, 3x10mm
	W601	70179893	Wire
	WI52	70179391	Wire, FFC
	WI53	70179390	Wire, FFC
	Y101	70971218	Owners Manual
b	Y101	70971221	Owners Manual
c	Y101	70971215	Owners Manual
d	Y101	70971201	Owners Manual
e	Y101	70971201	Owners Manual
f	Y101	70971245	Owners Manual
	Y103	70942463	Dew Caution Sheet
e	Y103	70942466	Sheet
f	Y103	--------	
	Y104	70933070	Cover
e	Y104	--------	
f	Y104	--------	
	Y105	23365122	Cable
	Y106	70148399	Remote Control Unit, VT-11F
c	Y106	70148328	Remote Control Unit, VT-21F
d	Y106	70148328	Remote Control Unit, VT-21F
e	Y106	70148332	Remote Control Unit, VT-21F-UA
f	Y106	70148415	Remote Control Unit, VT-49F
c	Y111	70971202	Owners Manual (OSP)
d	Y111	70971202	Owners Manual (OSP)
e	Y111	70971202	Owners Manual (OSP)
f	Y111	70971202	Owners Manual (OSP)
	ZT01	23153736	Resonator, CSB455EB20